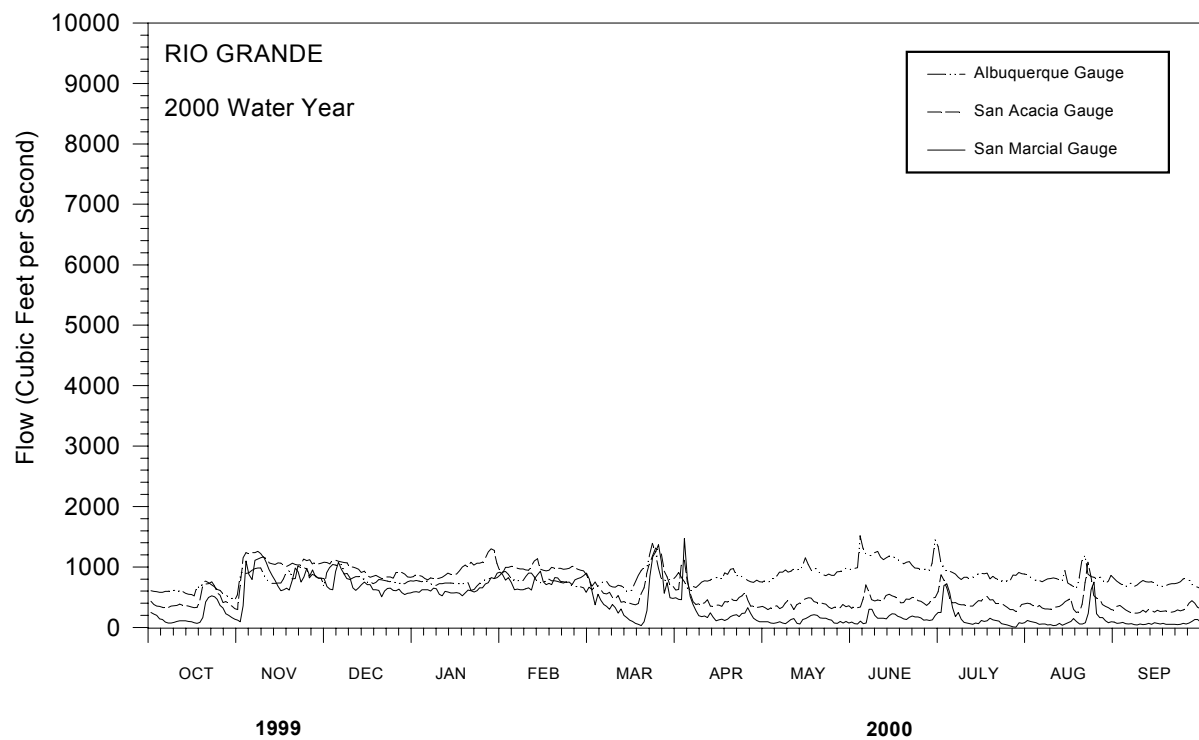


2000 POPULATION MONITORING OF RIO GRANDE SILVERY MINNOW

Final Report



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INTRODUCTION

Population information on Rio Grande silvery minnow and the associated Middle Rio Grande (Rio Grande between Velarde, New Mexico and Elephant Butte Reservoir) fish community has been gathered regularly since 1987. The first studies were conducted by Platania (1993a) from 1987-1992 to determine spatial and temporal changes in the ichthyofaunal community and to provide resolution of species-specific habitat use patterns. A key purpose of those preliminary studies was to supply additional information on the conservation status of Rio Grande silvery minnow. Quarterly sampling efforts during the summer and autumn of 1989 and 1990 revealed that densities of Rio Grande silvery minnow were extremely low. Based on previous samples, these low densities indicated a rapid decline of this species in its already greatly reduced range. The 90-95% reduction in the range of Rio Grande silvery minnow and threats to its continued persistence in the Middle Rio Grande were central to this species being listed as endangered by the U.S. Fish and Wildlife Service (U.S. Department of Interior, 1994).

From 1992 until present, the U.S. Bureau of Reclamation, U.S. Fish and Wildlife Service, New Mexico Department of Game and Fish, and U.S. Corps of Engineers have cooperated to fund numerous ichthyofaunal studies in the Middle Rio Grande. Among these studies was the long-term monitoring of the distribution and relative abundance of the Middle Rio Grande fish community at numerous sites between Angostura Diversion Dam and Elephant Butte Reservoir that was initiated in 1993. While Rio Grande silvery minnow was the primary focus of these efforts, these research activities were designed to provide information about the entire fish community.

The objective of the 2000 collecting activities was to monitor populations of Rio Grande silvery minnow and the associated fish community. Seasonal and spatial differences in population structure and species densities were examined to determine the ecological dynamics within this system. Annual changes in the distribution, abundance, and composition of all fish species were also assessed. Information obtained from this study will allow a more thorough understanding of the current conservation status and population dynamics of Rio Grande silvery minnow both of which are important components for the recovery of this species.

STUDY AREA

The headwaters of the Rio Grande are located in the San Juan Mountains of southern Colorado. The Rio Grande flows about 750 km through New Mexico. The Rio Chama is the only major perennial tributary of the Rio Grande in New Mexico and confluences with it near the town of Española. Snowmelt from southern Colorado and northern New Mexico provides the majority of water for the Rio Grande, but transmontane diversions from the San Juan River drainage (Colorado River basin) supplement flow. The highest flow in the Rio Grande generally occurs during spring snowmelt, while the lowest flow usually occurs in late summer and autumn. Low flow later in the year is due, in part, to the large diversions of water out of the river and into irrigation canals. Summer thunderstorms periodically augment low flow in discrete reaches, but do not ensure that the river channel will remain wetted. Precipitation in the region is low and averages <25 cm/year (Gold and Denis, 1985).

The Middle Rio Grande is defined as the reach between Velarde, New Mexico and Elephant Butte Reservoir (Figure 1). This reach changes considerably through its 364 km length. At high elevations, the Middle Rio Grande was a narrow, canyon-bound cold river with large substrata and a salmonid-dominated fish community. In contrast, downstream areas were 50-250 m wide, sand-bottomed, and supported a warmwater fish community. Our area of interest within the Middle Rio Grande was the current range of Rio Grande silvery minnow (i.e., below Cochiti Dam to the inflow of Elephant Butte Reservoir). The Cochiti Reach portion of the Rio Grande (between Cochiti Dam and

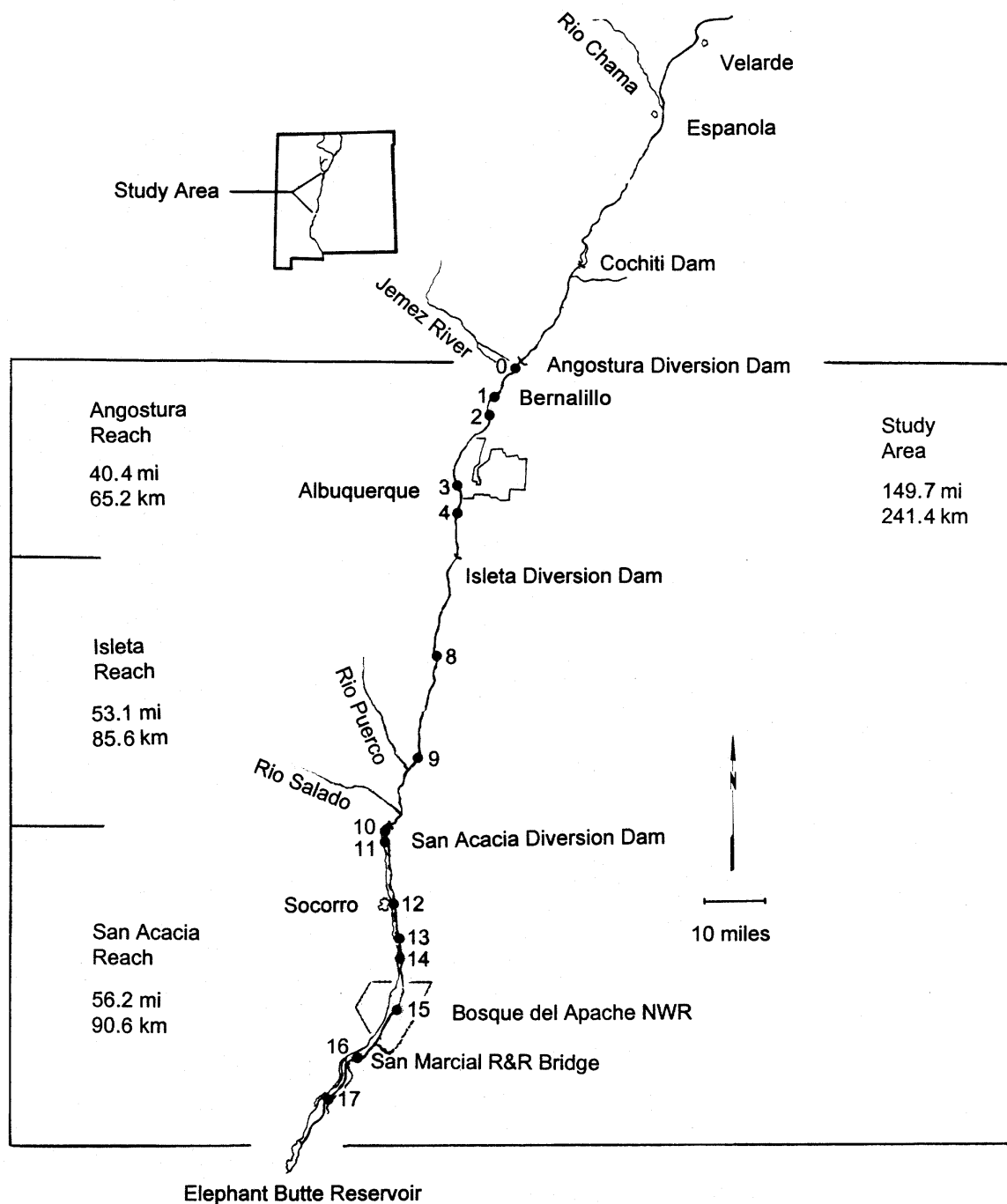


Figure 1. Map of the Middle Rio Grande and study area (numbered dots are sampling localities—see Table A-1).

Angostura Diversion Dam) passes first through Cochiti Pueblo, then Santo Domingo Pueblo, and finally San Felipe Pueblo; access is currently limited within this entire reach. The last comprehensive ichthyofaunal surveys of the Rio Grande in the Cochiti Reach documented the presence and low abundance of Rio Grande silvery minnow on Santo Domingo and San Felipe pueblos (Platania, 1995) but no Rio Grande silvery minnow were present on Cochiti Pueblo (Platania, 1993b).

Flow in the Rio Grande is regulated by five mainstem reservoirs on the rios Chama and Grande and numerous smaller irrigation diversion dams throughout the drainage. The complex system of ditches, drains, and conveyance channels provide water for extensive irrigated agriculture in the Rio Grande Valley. Cochiti Reservoir, located 76 km above Albuquerque and operational in 1973, is the primary flood control reservoir on the mainstem of the Middle Rio Grande.

The section of river from Angostura Diversion Dam to Bernalillo was a transition zone where the river channel became more braided, the floodplain widened, and substrata was primarily sand and silt. From Bernalillo downstream to Albuquerque, the river channel often exceeded 100 m in width and lower velocity habitats were more common. Backwaters were more abundant in this reach than between Cochiti and Angostura diversion dams and substrata larger than sand was rare.

Downstream of Albuquerque, the Rio Grande was a wide and meandering river with a predominantly sand substrata, high suspended silt load, and a broad variety of mesohabitats. The mainstem channel was generally wide (100-200 m), <1 m deep, and had a current velocity of <1 m/s. From approximately the middle of Bosque del Apache National Wildlife Refuge to Elephant Butte Reservoir, the river channel was generally less than 50 m wide.

Diel and seasonal discharge varied greatly during this study (Figure 2). There was a general trend of lower flow at downstream locations (i.e., U.S. Geological Survey (USGS) San Acacia Gauge [#08354900] and USGS San Marcial Gauge [#08358400]) compared to upstream ones (i.e., USGS Albuquerque Gauge [#08330000]). Since 1973, flow in the Rio Grande has been largely dictated by releases from Cochiti Dam. In 2000, flow was continuous in the Angostura and Isleta reaches, but there was a period of discontinuous flow in the lower section of the San Acacia reach during late July. Flows during the 2000 monitoring activities were generally moderate to low throughout the year and an extended period of low flows persisted from April through September.

METHODS

This study was structured to monitor populations of Rio Grande silvery minnow and the associated fish community at selected sites (see Table A-1, Appendix A) throughout the study area. The bi-monthly sampling efforts during the study allowed for determination of general spatial and temporal changes in population structure and species densities. Sampling was conducted in February, April, June, August, October, and December of 2000 (Appendix B).

Reach names are taken from the diversion structure at the upstream boundary of that reach of river. The Angostura Reach (Angostura Diversion Dam to Isleta Diversion Dam) had five sampling localities and the Isleta Reach (Isleta Diversion Dam to San Acacia Diversion Dam) had two collecting sites. There were eight sampling localities in the San Acacia Reach (San Acacia Diversion Dam to Elephant Butte Reservoir). No sampling was conducted in the Cochiti Reach as the majority of this section of the river is under tribal control.

Fish were collected by rapidly drawing a two-person 2.1 m x 1.8 m small mesh (0.5 cm) seine through discrete mesohabitats (usually <10 m). Large fish (e.g., > 300 mm standard length, SL) were released at the site of capture. Retained fish were fixed in the field in 10% formalin and returned to the laboratory where they were sorted, identified to species, counted, measured (minimum and maximum size; mm SL), transferred to 70% ethyl alcohol, and catalogued into the Fish Division of the Museum of Southwestern Biology (MSB) at the University of New Mexico. All Rio Grande silvery minnow were counted, identified to age-class, and released at the site of capture. Graphs of fish

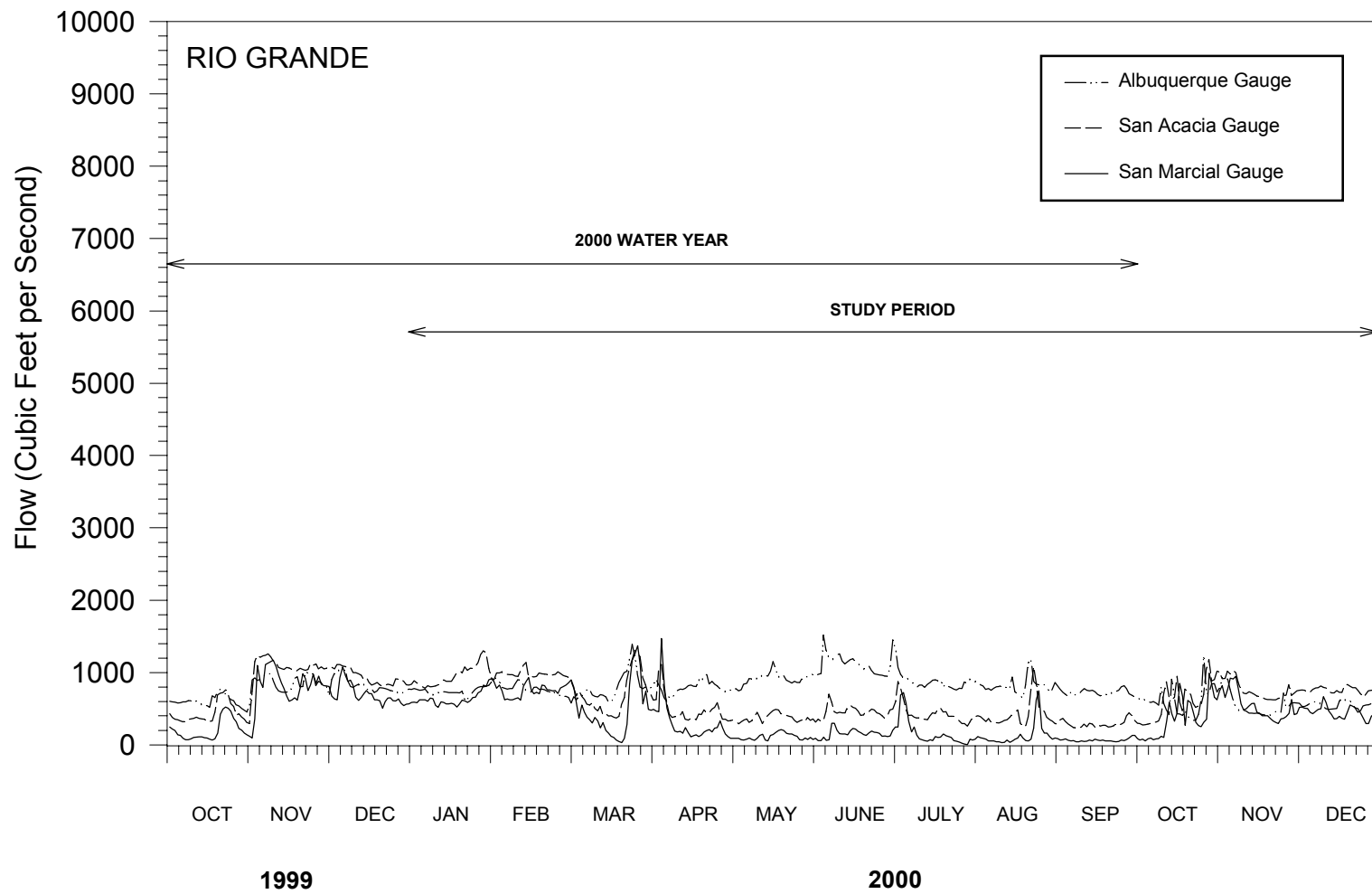


Figure 2. Hydrograph of the Rio Grande, NM at Albuquerque, San Acacia, and San Marcial for the 2000 water year and study period.
*Note: Hydrological data is from the U.S. Geological Survey and is provisional.

catch per unit effort are provided for the 10 focal species (the 10 most common taxa that occur throughout the study area) for each collection locality by sampling period (see Figures A-1 to A-7, Appendix A). Scientific and common names of fishes in this report generally follow Robins et al. (1991; Table 1). Common names, arranged in phylogenetic order, are used in tables and the report.

The terms “discontinuous flow” and “river drying” are used in this report and are meant to represent discrete stages in the continuum between a flowing river and dry river bed. Discontinuous flow refers to a river reach of indeterminate length which retains some standing water but no longer maintains measurable flow. Initially, a discontinuous reach will consist of one single pool that dissipates to become a series of smaller isolated pools. The term “river drying” is applied when water no longer remains in a relatively extensive portion of the river, as opposed to the dry reach between isolated pools.

The most important difference between duration of discontinuous flow and duration of river drying is that the former condition denotes the presence of some standing water in which fish could presumably survive for at least a short time. In the case of discontinuous flow, information on duration of the event is important as likelihood of survival is negatively correlated with duration. Reconnection of isolated pools and restoration of continuous flow before fish, and other members of the aquatic community, succumb is dependent on many factors including tenure of isolation and climatic conditions. In the case of river drying, surface water is no longer present and as a result all aquatic organisms have died. Duration of drying, in these situations, is irrelevant as the organisms in question are just as dead one day after drying as 10 days after drying. The need for these distinctions become evident when fallacious attempts are made to exculpate a river drying event by invoking its short duration.

RESULTS

SUMMARY OF 2000 COLLECTING ACTIVITIES

Rio Grande silvery minnow

The number of Rio Grande silvery minnow collected within a particular study reach in 2000 varied both within and between seasons. Catch rate of Rio Grande silvery minnow also varied noticeably in and between sampling reaches (Figures 3 and 4). The lowest number of Rio Grande silvery minnow (n=18) were taken during October.

A total of 260 seine hauls were taken during the February 2000 sampling foray of which 49 (hauls) contained Rio Grande silvery minnow. That sampling effort yielded no Rio Grande silvery minnow from the Angostura Reach and four from the Isleta Reach. The vast majority (97.8%; n=175) of Rio Grande silvery minnow taken in February were from localities downstream of San Acacia Diversion Dam.

There were slightly more Rio Grande silvery minnow collected in April (n=192) than in February (n=179). In April 2000, a single Rio Grande silvery minnow was collected in the Angostura Reach and none were taken in the Isleta Reach. Most of the remainder of the Rio Grande silvery minnow were collected from sites within the upstream portion of the San Acacia Reach.

The June foray yielded slightly more Rio Grande silvery minnow (n=243) than the February or April sampling forays. The numbers of young-of-year Rio Grande silvery minnow were low and most occurred at the two lower-most sites in the San Acacia Reach. No young-of-year individuals were collected in either the Angostura or Isleta reaches.

The largest collection of Rio Grande silvery minnow in the October sampling foray was made at the uppermost site in the San Acacia Reach. The remainder of the sites in the San Acacia Reach

Table 1. Scientific and common names and species codes of fish collected from the Middle Rio Grande for 2000.

Scientific Name	Common Name	Code
Order Clupeiformes		
Family Clupeidae	herrings	
<i>Dorosoma cepedianum</i>	gizzard shad	(GZS)
Order Cypriniformes		
Family Cyprinidae	carps and minnows	
<i>Cyprinella lutrensis</i>	red shiner	(RDS)
<i>Cyprinus carpio</i>	common carp	(CCA)
<i>Hybognathus amarus</i>	Rio Grande silvery minnow	(RGM)
<i>Pimephales promelas</i>	fathead minnow	(FHM)
<i>Platygobio gracilis</i>	flathead chub	(FHC)
<i>Rhinichthys cataractae</i>	longnose dace	(LND)
Family Catostomidae	suckers	
<i>Carpiodes carpio</i>	river carpsucker	(RCS)
<i>Catostomus commersoni</i>	white sucker	(WHS)
Order Siluriformes		
Family Ictaluridae	bullhead catfishes	
<i>Ameiurus melas</i>	black bullhead	(BBH)
<i>Ameiurus natalis</i>	yellow bullhead	(YBH)
<i>Ictalurus punctatus</i>	channel catfish	(CCT)
Order Cyprinodontiformes		
Family Poeciliidae	livebearers	
<i>Gambusia affinis</i>	western mosquitofish	(MOS)
Order Perciformes		
Family Percichthyidae	temperate basses	
<i>Morone chrysops</i>	white bass	(WHB)

Table 1 (continued). Scientific and common names and species codes of fish collected from the Middle Rio Grande for 2000.

Scientific Name	Common Name	Code
Order Perciformes		
Family Centrarchidae	sunfishes	
<i>Lepomis cyanellus</i>	green sunfish	(GNS)
<i>Lepomis macrochirus</i>	bluegill	(BGL)
<i>Micropterus dolomieu</i>	smallmouth bass	(SMB)
<i>Micropterus salmoides</i>	largemouth bass	(LMB)
<i>Pomoxis annularis</i>	white crappie	(WCR)
Family Percidae	perches	
<i>Perca flavescens</i>	yellow perch	(YWP)
<i>Stizostedion vitreum</i>	walleye	(WLE)

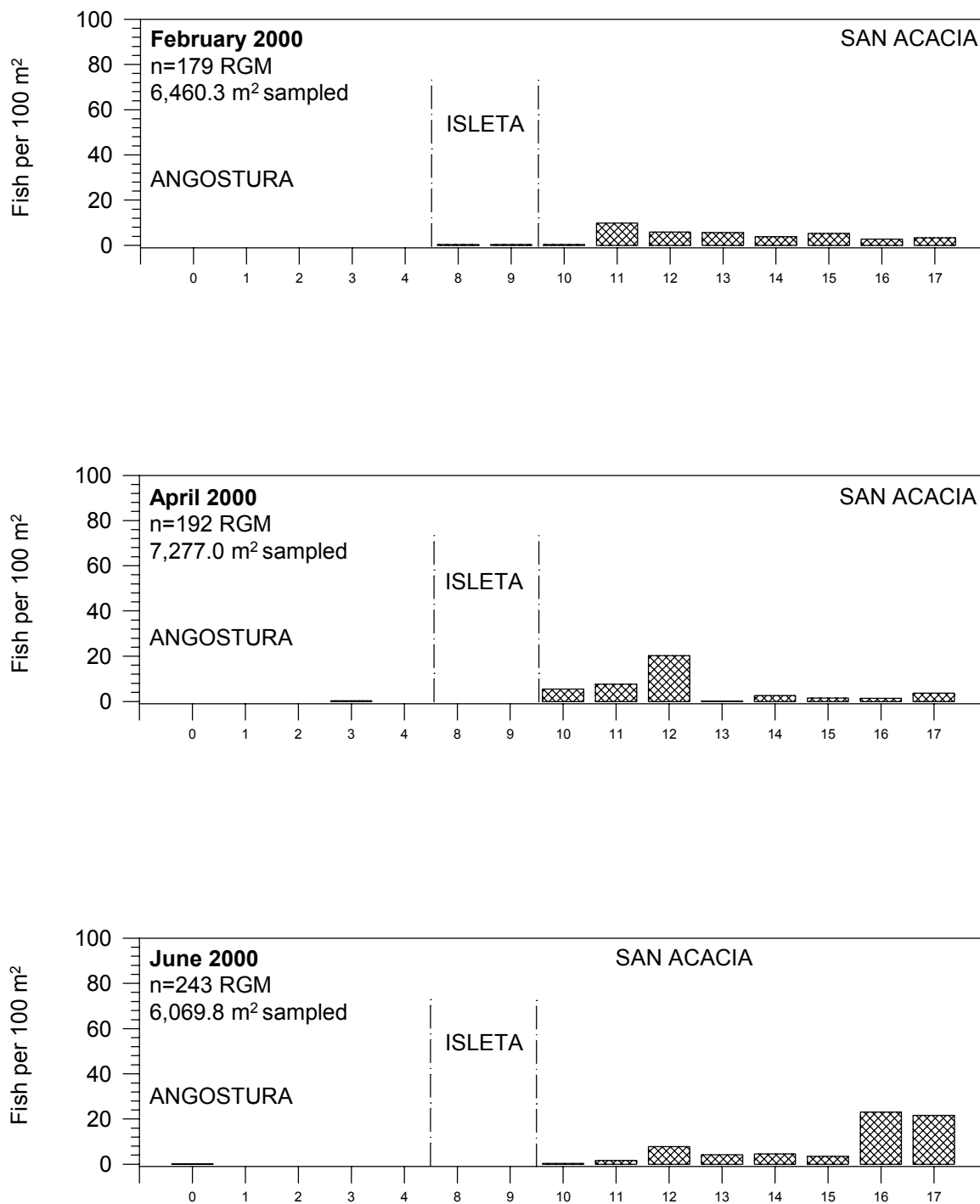


Figure 3. Rio Grande silvery minnow (RGM) catch rates (CPUE) for February, April, and June of 2000 for each collection locality in the Middle Rio Grande.

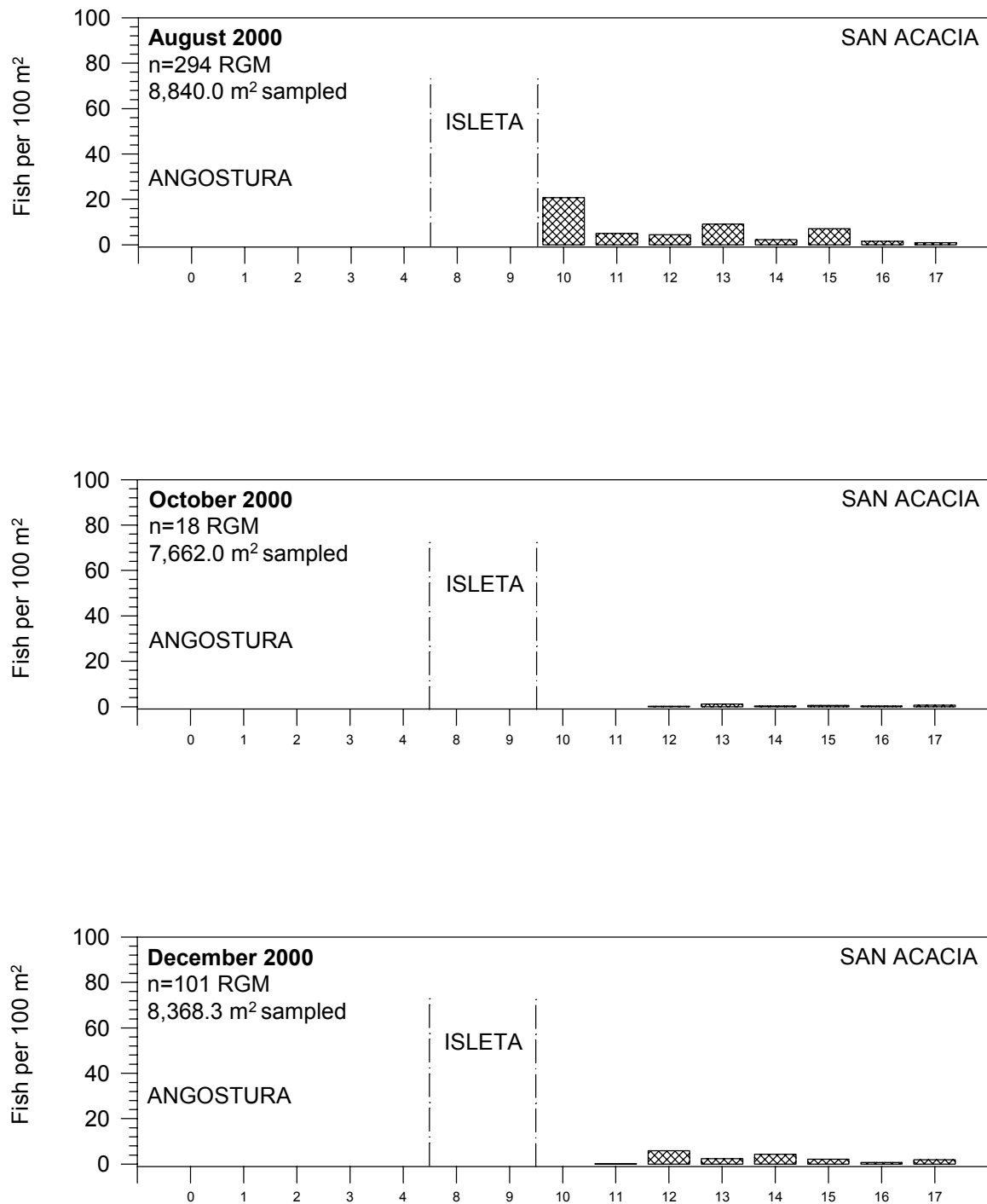


Figure 4. Rio Grande silvery minnow (RGM) catch rates (CPUE) for August, October, and December of 2000 for each collection locality in the Middle Rio Grande.

produced only a few individuals and there were no clear trends between the catch rates at different sites. No Rio Grande silvery minnow were taken in either the Angostura or Isleta reaches.

The October and December sampling trips both produced few Rio Grande silvery minnow. The upper sampling sites (i.e., Angostura and Isleta reaches) produced no individuals despite extensive effort. The overall population levels of Rio Grande silvery minnow were so low by the end of the year that no real differences could be discerned between sites within the San Acacia Reach.

The Angostura Reach yielded the fewest silvery minnow ($n=2$) in 2000 (Figure 5), followed by the Isleta Reach ($n=4$), and San Acacia Reach ($n=1,021$). The catch rate and total number of Rio Grande silvery minnow collected in 2000 within the Angostura and Isleta reaches were far lower than has ever been recorded in these reaches since population monitoring efforts began in 1993. The few Rio Grande silvery minnow collected in these reaches were present during samples taken at the beginning of the year. No young-of-year Rio Grande silvery minnow were taken in either the Angostura or Isleta reaches in 2000.

The San Acacia Reach yielded moderate numbers of Rio Grande silvery minnow throughout the year with the highest catch rates occurring in June and August. The slight increase in catch rates during these periods was caused primarily by the appearance of moderate numbers of young-of-year Rio Grande silvery minnow. The largest number of individuals occurred at the upstream-most sites in the San Acacia Reach (sites 10-12) in April, at the downstream-most sites (sites 15-17) in June, and back in the upstream-most sites by August. Catch rates were lower during October and December than during other times of the year.

Fish Community

The ichthyofaunal community in the Middle Rio Grande between Angostura Diversion Dam and Elephant Butte reservoir was numerically dominated by cyprinids (Table 2). The native ichthyofauna consisted of six species (red shiner, Rio Grande silvery minnow, fathead minnow, flathead chub, longnose dace, and river carpsucker) that were represented by sample numbers between 207 and 25,515. Longnose dace ($n=207$) was the least abundant native fish with flathead chub ($n=501$) being the second least collected native taxon. Red shiner was the most abundant native species ($n=25,515$) followed by river carpsucker ($n=2,087$), fathead minnow ($n=1,355$), and Rio Grande silvery minnow ($n=1,027$). Some of the more abundant introduced species were western mosquitofish ($n=4,681$), white sucker ($n=3,768$), channel catfish ($n=755$), common carp ($n=408$), and white crappie ($n=128$). The remaining ten nonnative fish species were at notably lower abundances than the other nonnatives.

There were notable seasonal changes in the relative abundance of the ten focal species for 2000 (Figures 6 and 7). White sucker was the most abundant species during the June collecting foray apparently caused by a peak in reproduction in spring. Red shiner numbers began to increase by the June sampling trip and it was the most abundant species collected from August through December. Rio Grande silvery minnow reached their maximum density in June and August but they were quite rare throughout the year. The densities of most species increased from spring (April) to summer (June and August). Densities for most species began to drop by October with the exception of red shiner and western mosquitofish which both reached their peak densities in October. Catch rates in December dropped for nearly all taxa.

Besides temporal variation in the relative abundances in the fish community, there were longitudinal differences in fish densities (Figure 8). Red shiner catch rates were highest in the San Acacia Reach and lowest in the Angostura Reach. Longnose dace and white sucker exhibited a shared pattern of higher catch rates in the Angostura Reach compared to the Isleta or San Acacia reaches. Fathead minnow, river carpsucker, and channel catfish were most abundant in the Isleta Reach. Rio Grande silvery minnow was present in the San Acacia Reach at low densities, but nearly

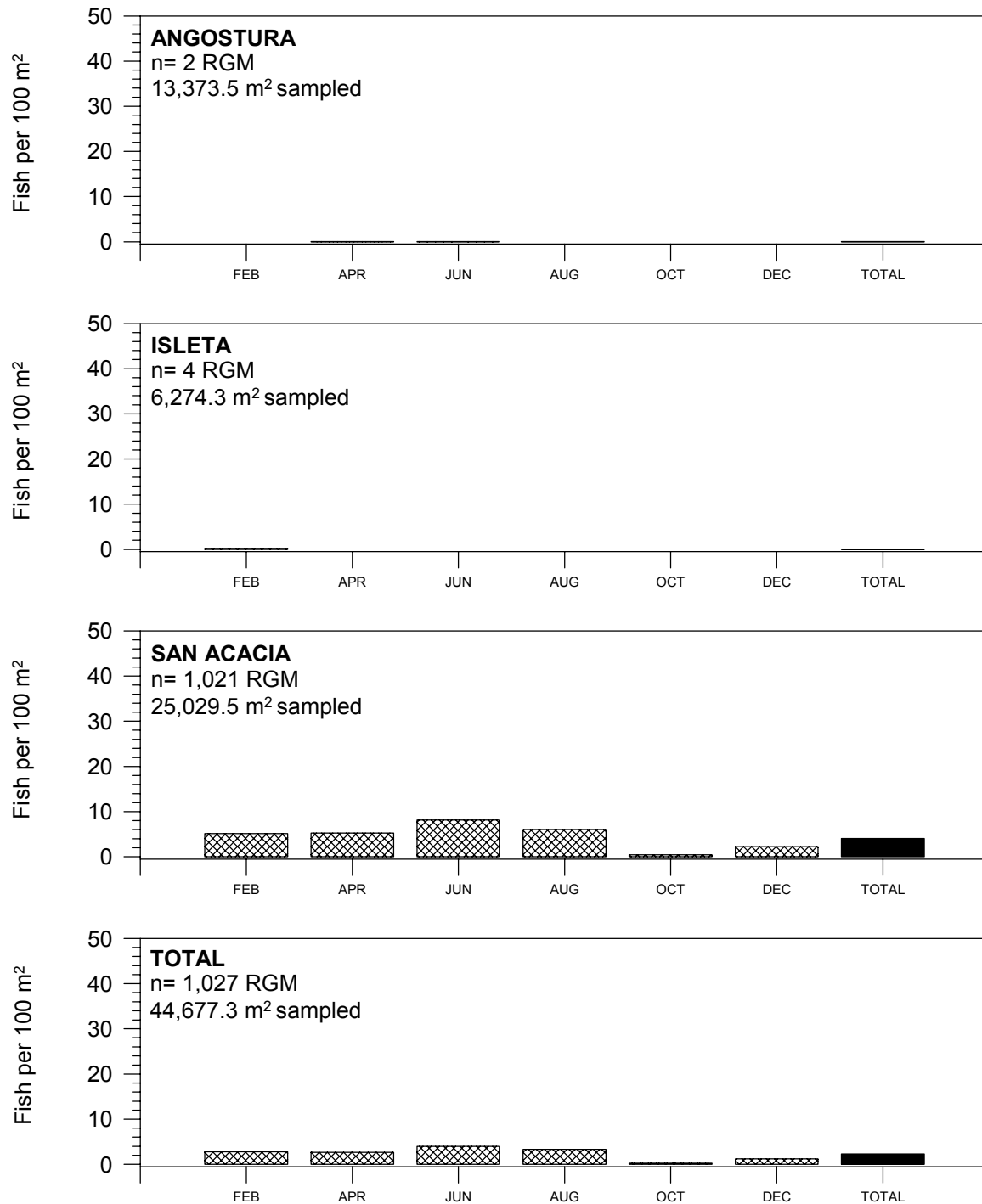


Figure 5. Rio Grande silvery minnow (RGM) catch rates (CPUE) by river reach for each sampling period of 2000 in the Middle Rio Grande.

Table 2. Summary of ichthyofaunal composition and collection data from the Middle Rio Grande for 2000.

SPECIES	RESIDENCE STATUS ¹	TOTAL NUMBER OF SPECIMENS	% OF TOTAL
HERRINGS			
gizzard shad	I	30	0.07
CARPS AND MINNOWS			
red shiner *	N	25,515	62.96
common carp *	I	408	1.01
Rio Grande silvery minnow *	N	1,027	2.53
fathead minnow *	N	1,355	3.34
flathead chub *	N	501	1.24
longnose dace *	N	207	0.51
SUCKERS			
river carpsucker *	N	2,087	5.15
white sucker *	I	3,768	9.30
BULLHEAD CATFISHES			
black bullhead	I	3	<0.01
yellow bullhead	I	23	0.06
channel catfish *	I	755	1.86
LIVEBEARERS			
western mosquitofish *	I	4,681	11.55
TEMPERATE BASSES			
white bass	I	7	0.02
SUNFISHES			
green sunfish	I	1	<0.01
bluegill	I	6	0.01
smallmouth bass	I	1	<0.01
largemouth bass	I	16	0.04
white crappie	I	128	0.32
PERCHES			
yellow perch	I	2	<0.01
walleye	I	3	<0.01
TOTAL		40,523	100

N = native; I = nonnative

* indicates one of the 10 focal taxa used in all community composition figures

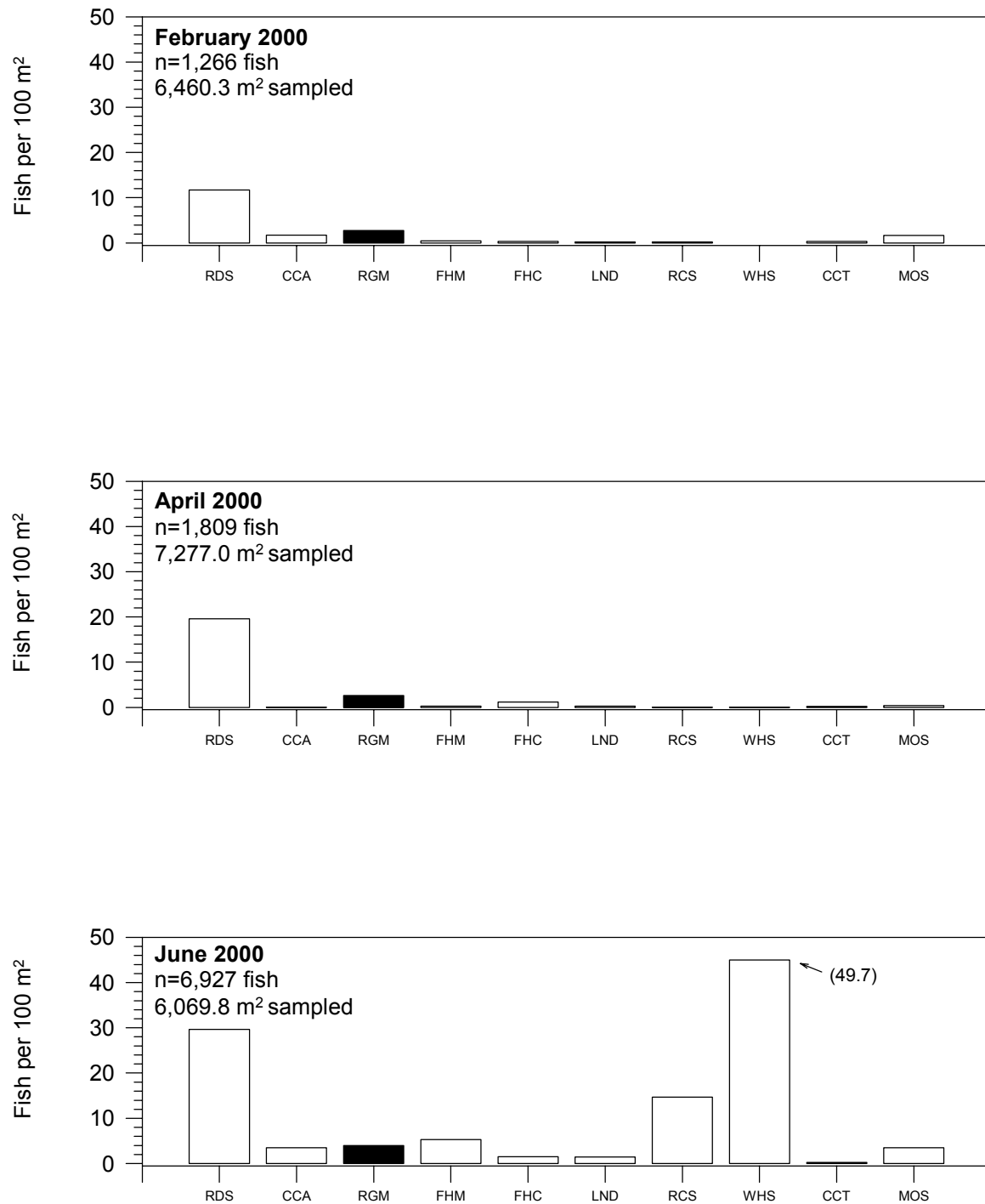


Figure 6. Fish catch rates (CPUE) in February, April, and June of 2000 for each focal species (see Table 1 for species abbreviations) in the Middle Rio Grande. Histogram bar for Rio Grande silvery (RGM) is black to highlight this species.

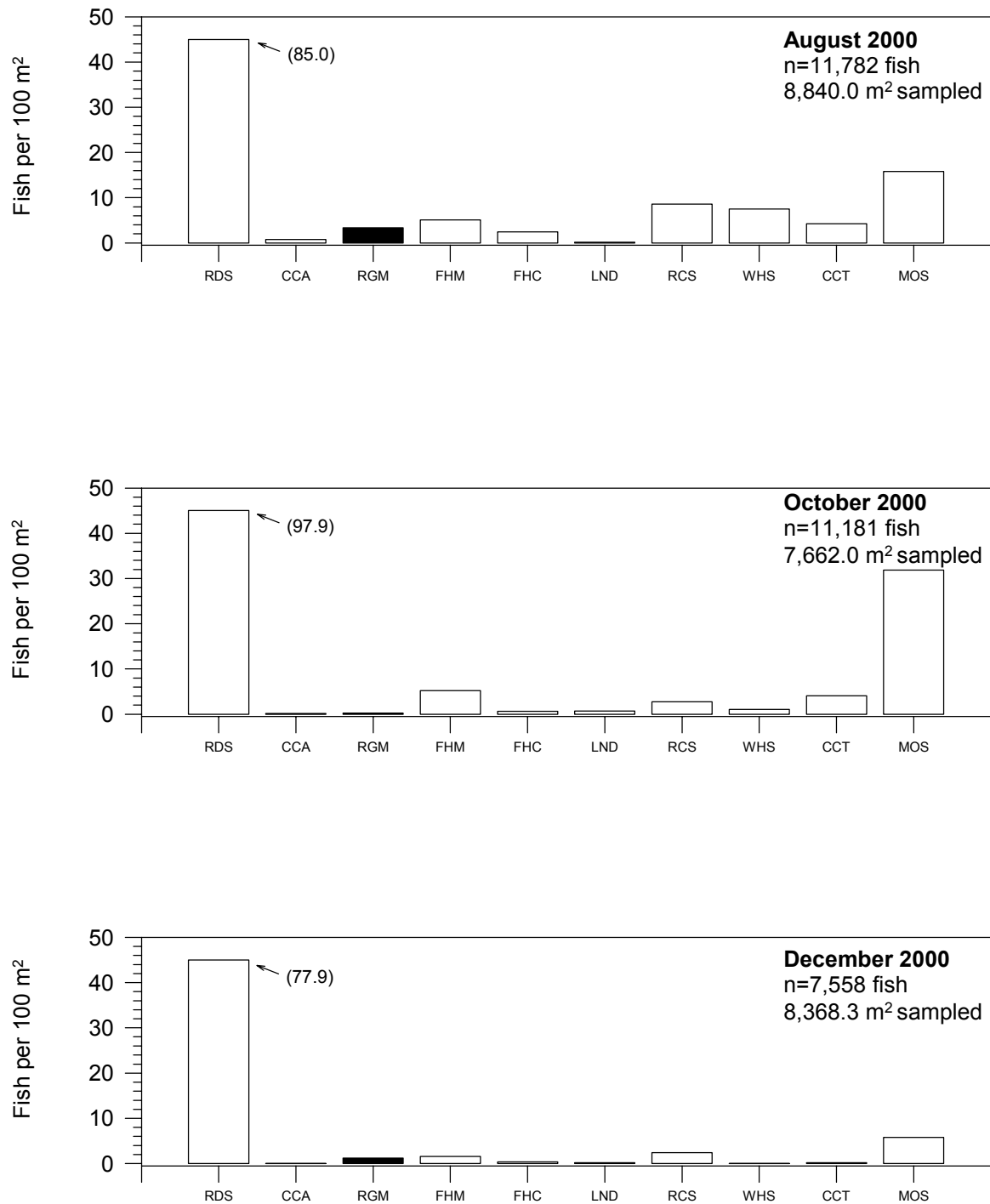


Figure 7. Fish catch rates (CPUE) in August, October, and December of 2000 for each focal species (see Table 1 for species abbreviations) in the Middle Rio Grande. Histogram bar for Rio Grande silvery (RGM) is black to highlight this species.

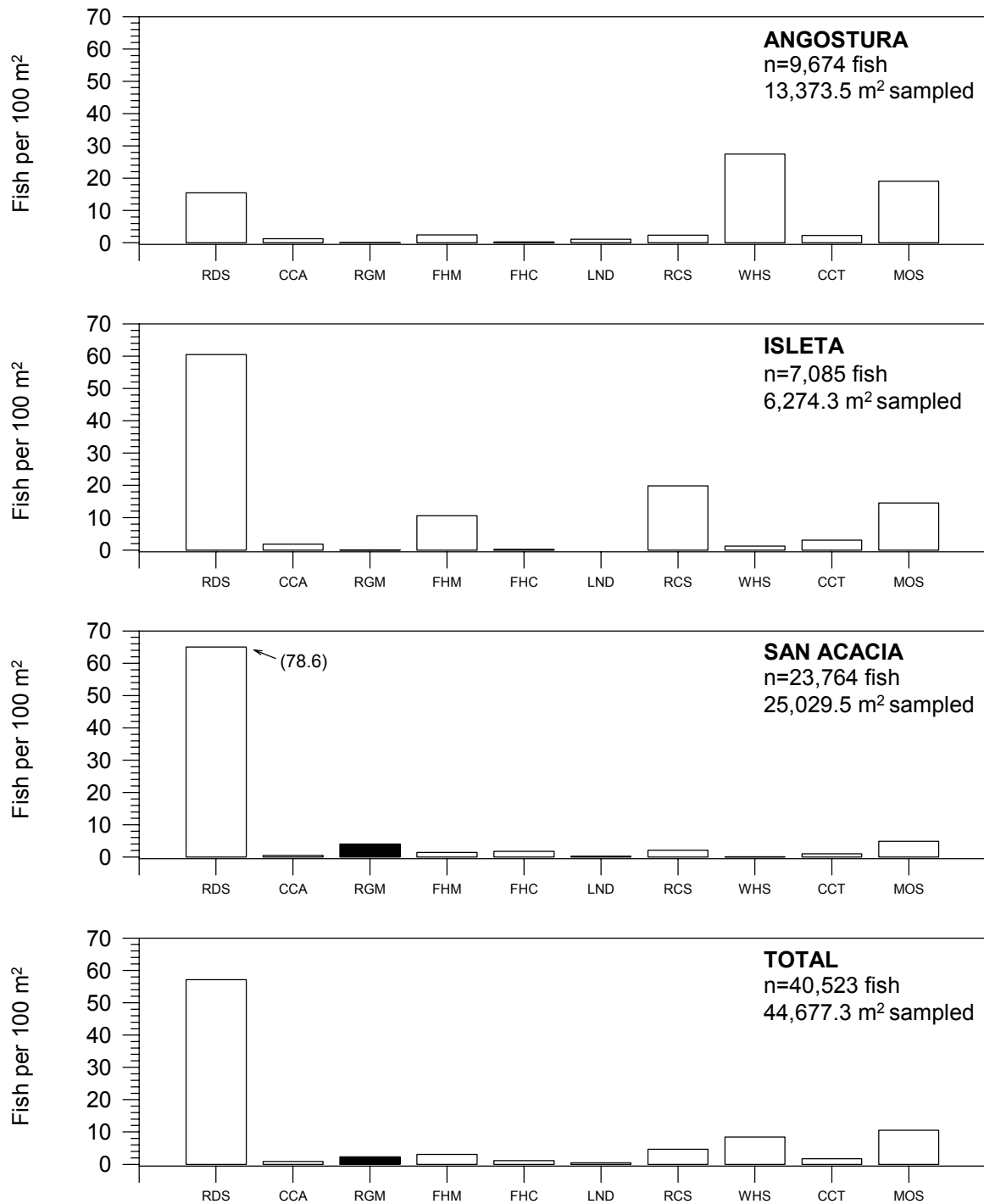


Figure 8. Fish catch rates (CPUE) by river reach for each focal species (see Table 1 for species abbreviations) in the Middle Rio Grande for 2000. Histogram bar for Rio Grande silvery minnow (RGM) is black to highlight this species.

absent in the Angostura and Isleta reaches. Density of western mosquitofish was higher in the Angostura and Isleta reaches compared to the San Acacia Reach.

Relative abundance of fish in 2000 fluctuated between sampling periods for each of the river reaches (Figure 9). An increase, of varying magnitudes, in the relative abundances of fish was discerned in June and August samples but declines were apparent by December. Notable increases in fish catch rate in the Isleta and San Acacia reaches occurred in June and August although the relative density of fish was higher in the Isleta Reach. Angostura Reach fish catch rates were highest in June and October.

Catch rates of individual taxa in the study reaches varied extensively by sampling period (Figures 10 and 11). Fish catch rates in the Angostura Reach were moderate for most of the focal species except red shiner, white sucker, and western mosquitofish which were consistently higher. Rio Grande silvery minnow catch rates in this reach were extremely low throughout 2000 and four of the six sampling forays did not produce any individuals. Relative abundances of river carpsucker and white sucker in the Angostura Reach increased during June but declined by October. Red shiner, channel catfish, and western mosquitofish were most abundant during August and October and declined by December.

Fish catch rates in the Isleta Reach, like those in the Angostura Reach, also peaked from June through October. Fathead minnow and white sucker were quite abundant by the June sampling foray. Rio Grande silvery minnow abundance in the Isleta Reach was extremely low throughout the year. Peak densities for red shiner and western mosquitofish both occurred in October just as they had in the Angostura Reach. Channel catfish were most abundant in the August sampling foray.

The relative abundance of red shiner in the San Acacia Reach remained high from June through December and peaked in October. Rio Grande silvery minnow catch rates in the San Acacia Reach were notably higher than in the Angostura or Isleta reaches throughout the year. However, there was never a spawning related peak in density during the low flow conditions that persisted throughout the spring and summer. Numbers of Rio Grande silvery minnow were extremely low by October and December of 2000. Other species (common carp, fathead minnow, flathead chub, longnose dace, river carpsucker, white sucker, channel catfish, and western mosquitofish) were present at relatively low abundance levels in the San Acacia Reach throughout 2000.

DISCUSSION

Spawning by Rio Grande silvery minnow occurs during spring and is initiated, in part, by increases in flow. Spring runoff (from high mountain snowmelt) was likely the historical source of this reproductive stimulus. Dams and reservoirs now moderate the magnitude, amplitude, and duration of spring discharge. During years of sufficient snowpack, flow through the Middle Rio Grande will remain continuous through June. Flows during spring non-drought years are of sufficient magnitude to result in spawning by Rio Grande silvery minnow. Young-of-year Rio Grande silvery minnow appear in collections soon after this period of elevated flow.

When peak flows in the spring are low, as in 2000, there appears to be a related decrease in the spawning effort and success of Rio Grande silvery minnow. Spring flows during drought years are greatly reduced in magnitude and duration because of the lack of snowmelt. The lack of base flows during this period of the year when Rio Grande silvery minnow are physiologically ready to spawn may reduce their likelihood of reproductive success. This problem is further compounded in drought years when large quantities of water are removed from the Rio Grande for irrigation in the early spring often drying the river in certain areas or absorbing the peak flows that result in spawning. Low precipitation in combination with river diversions resulted in a steady and extended period of low flow throughout 2000. The low densities of Rio Grande silvery minnow collected during 2000 and the lack

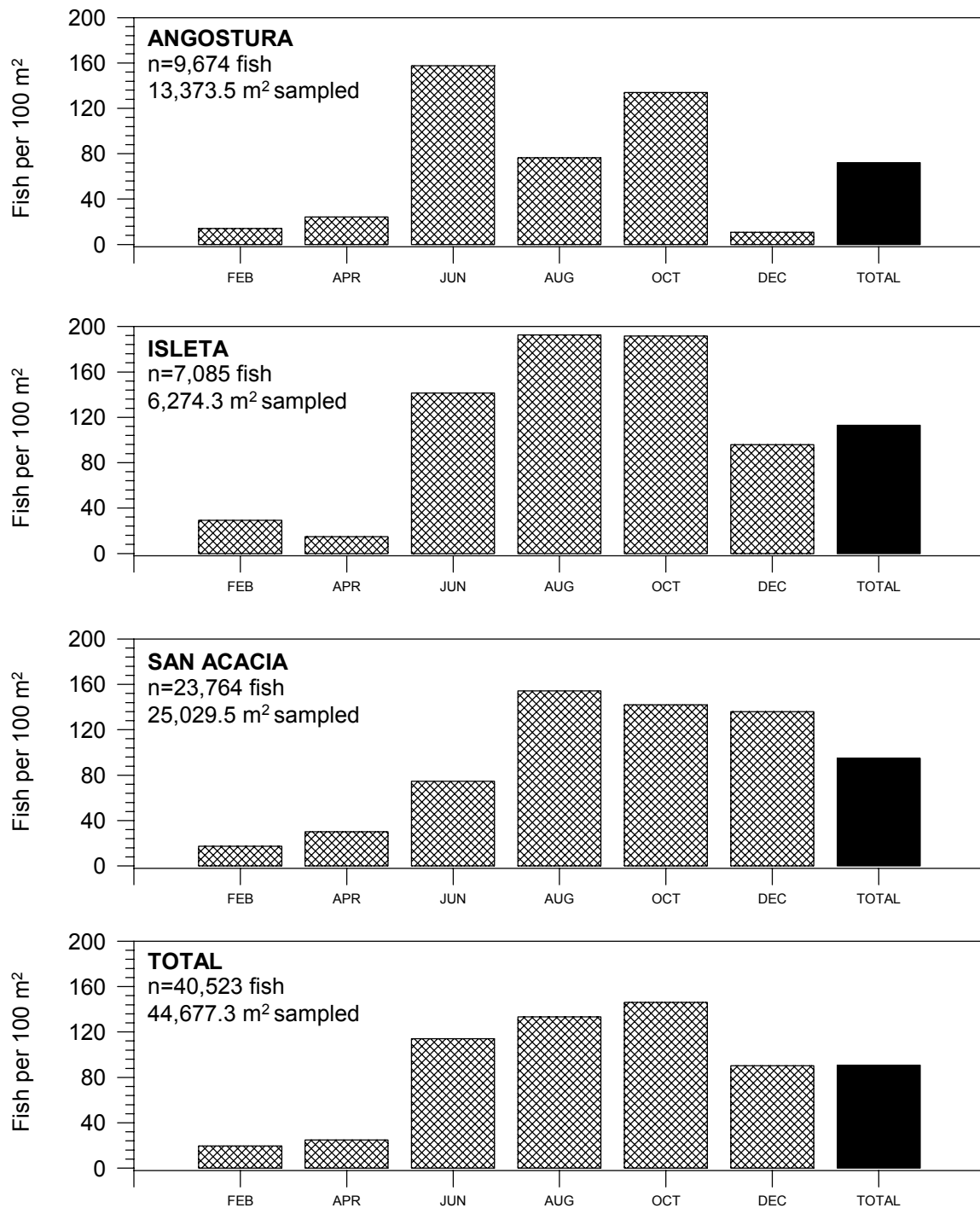


Figure 9. Fish catch rates (CPUE) by river reach for each sampling period in the Middle Rio Grande for 2000.

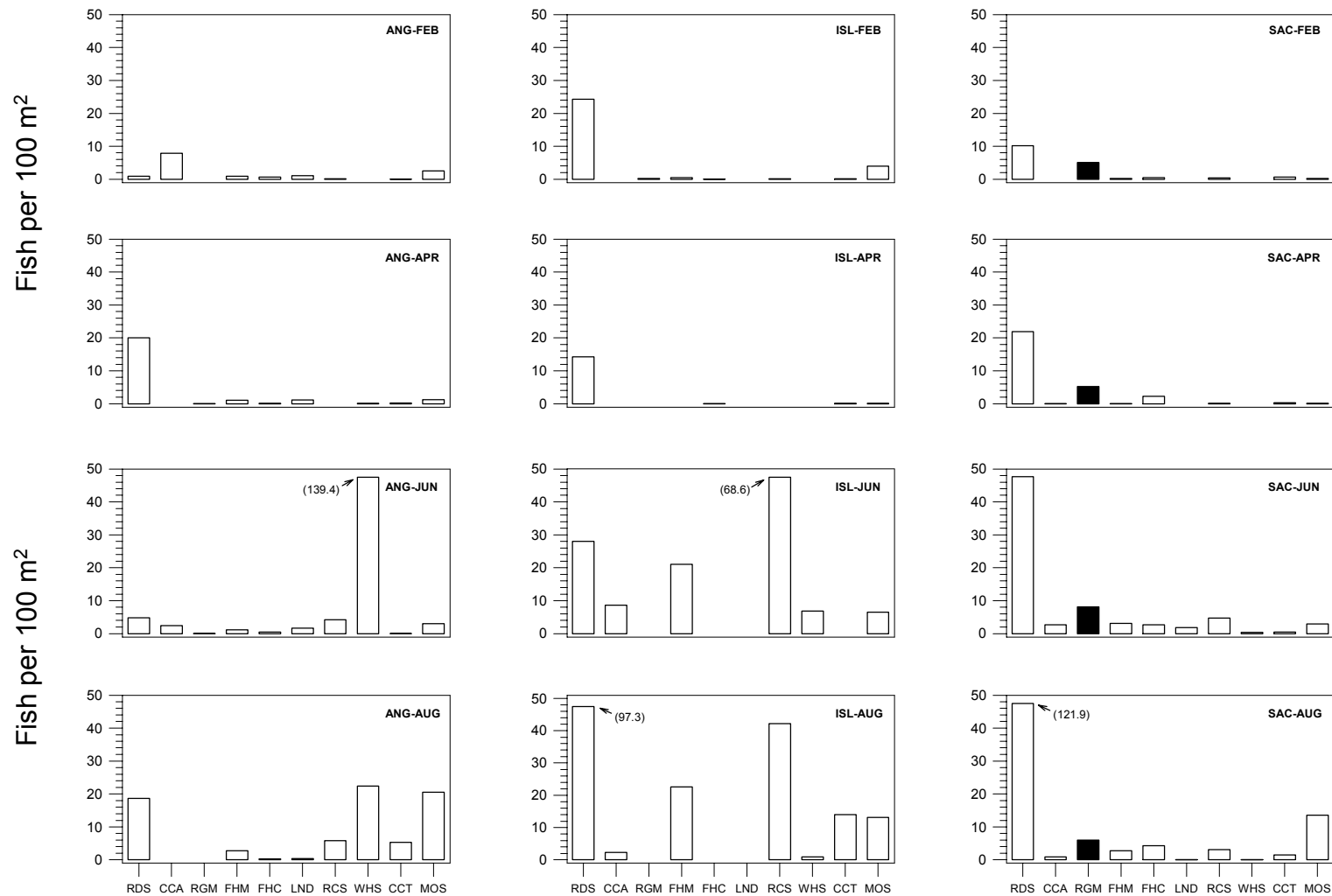


Figure 10. Fish catch rates (CPUE) by river reach for February, April, June, and August of 2000 for each focal species (see Table 1 for species abbreviations) in the Middle Rio Grande (ANG=Angostura, ISL=Isleata, and SAC=San Acacia). Histogram bar for Rio Grande silvery minnow (RGM) is black to highlight this species.

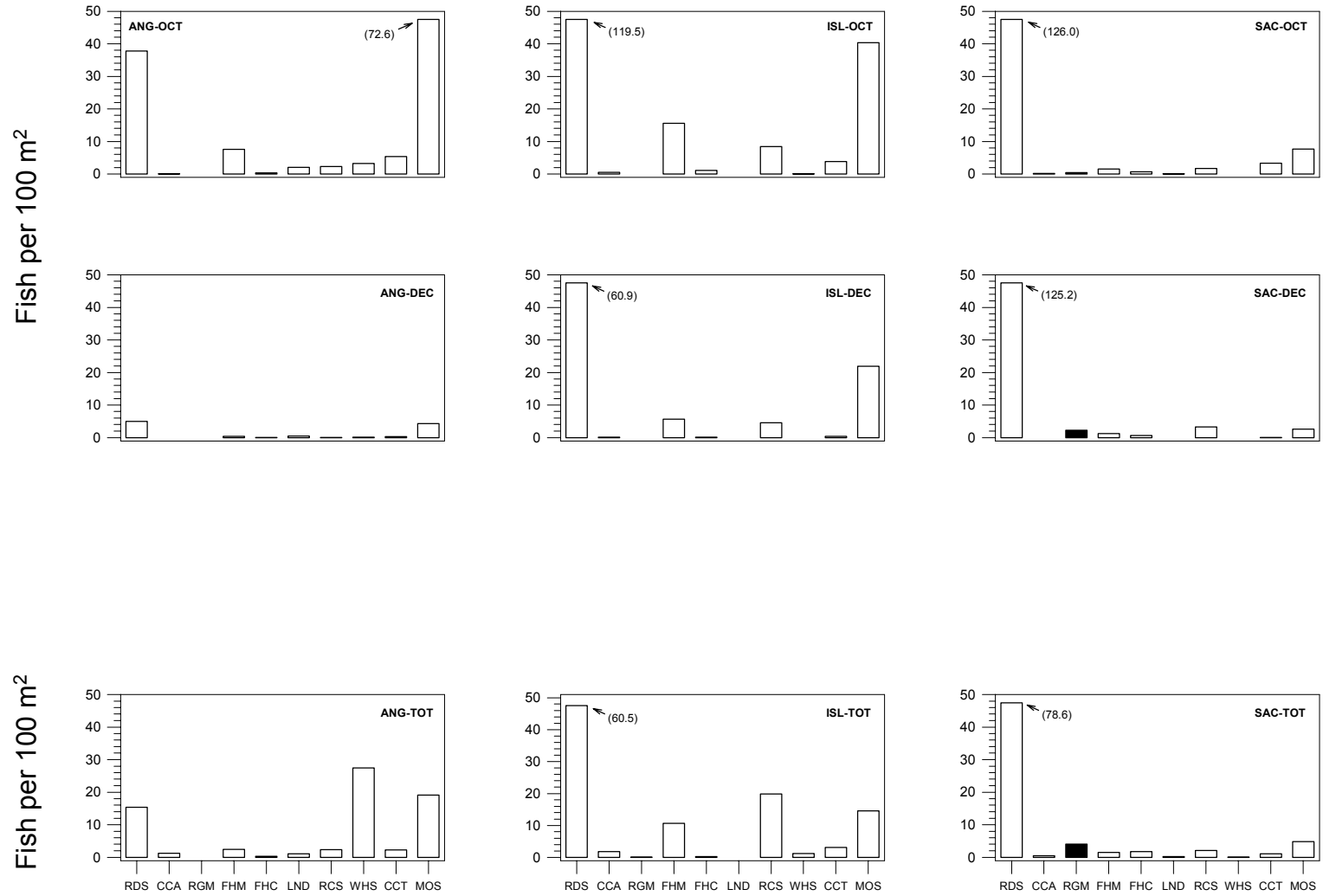


Figure 11. Fish catch rates (CPUE) by river reach for October, December, and annual total for 2000 for each focal species (see Table 1 for species abbreviations) in the Middle Rio Grande (ANG=Angostura, ISL=Isleata, and SAC=San Acacia). Histogram bar for Rio Grande silvery minnow (RGM) is black to highlight this species.

of a strong spawning season appear to have resulted in further declines in the overall population size of this endangered species.

There was a period of discontinuous flow during late July in the San Acacia Reach near San Marcial, NM that had a negative impact on Rio Grande silvery minnow. An exact accounting of the number of adult Rio Grande silvery minnow that died as a result of discontinuous flow and drying of portions of the river channel during summer of 2000 in the San Acacia Reach was not practical. The absence of continuous discharge in late July in lower portions of the San Acacia Reach (following modest Rio Grande silvery minnow spawning) likely resulted in the loss of age-0 Rio Grande silvery minnow from those areas. The greatest densities of age-0 Rio Grande silvery minnow during 2000 were found in the lower portion of the San Acacia Reach (near San Marcial, NM) where discontinuous flow and lateral drying of the river channel were most pronounced. Lateral drying of the river channel occurred in numerous areas throughout the San Acacia Reach throughout the spring and summer of 2000 as flows dropped periodically to very low levels (especially following the initiation of the irrigation season) and this resulted in losses of Rio Grande silvery minnow. Although these river drying events were not nearly of the magnitude of those seen in 1999 and 1996, their relative impact was magnified because of the extreme rarity of Rio Grande silvery minnow.

The 2000 population levels of Rio Grande silvery minnow, as determined from this monitoring effort, were especially low in the Angostura and Isleta reaches. There were very few adults and an absence of YOY Rio Grande silvery minnow in both of these reaches. Rio Grande silvery minnow catch rates during 2000 in the San Acacia Reach were several orders of magnitude greater than those recorded in the Angostura or Isleta reaches. However, the density of this species was markedly lower in the San Acacia Reach in 2000 compared to 1999. The effects of lateral river drying, extended periods of low flow, a greatly reduced spring runoff, continued downstream displacement of propagules in a fragmented river system, and already low densities all have likely contributed to this result in 2000.

The most plausible explanation for the decline in Rio Grande silvery minnow abundance in the Angostura Reach appears to be the fragmentation of their range and longitudinal displacement of their propagules (drifting eggs and larvae) below the instream barriers of Isleta Diversion Dam and San Acacia Diversion Dam. These channel-wide structures do not preclude downstream passage of fish or their reproductive products but do prevent fish movement upstream of the diversion dam structures. Given the reproductive ecology of this species, reach lengths, and diversion dam placement, the sequential decline and loss of this species from upstream to downstream was predicted (Platania and Altenbach, 1998). The fragmentation of this species range in the Middle Rio Grande as a result of Angostura, Isleta, and San Acacia diversion dams has been identified as an issue of paramount importance that requires resolution for recovery of Rio Grande silvery minnow (U.S. Fish and Wildlife Service, 1999).

The Isleta Reach is an intermediate reach, not only in geographic position but also in regards to flow. This reach does not maintain the volume or consistency of discharge as the Angostura Reach but, because of the numerous points of irrigation returns, has had an increased likelihood of maintaining some continuous flow compared to the San Acacia Reach. Issues regarding range fragmentation and downstream transport of silvery minnow propagules in the Angostura Reach are equally as important in the Isleta Reach. The decline in the Angostura Reach Rio Grande silvery minnow population will result in fewer eggs and larvae being transported into the Isleta Reach and will thereby negatively affect population levels in the latter reach. Likewise, fewer individuals in the Isleta and Angostura reaches will likely result in lower Rio Grande silvery minnow populations in the San Acacia Reach.

The barrier to upstream movement imposed by San Acacia Diversion Dam, reduced number of Rio Grande silvery minnow in upstream reaches, and downstream transport of silvery minnow eggs and larvae (especially those produced in the San Acacia Reach) into Elephant Butte Reservoir continue to adversely impact the San Acacia Reach population of this species. The effects of these

problems accumulate over time and become especially critical during periods when densities of individuals are extremely low, as was seen in 2000. Further losses in 2000 were caused by periods of discontinuous flow and lateral drying of the river channel during extended periods of low flow. Without efforts to maintain at least some flow in the Rio Grande in 2000, it is almost certain that larger losses of Rio Grande silvery minnow would have occurred perhaps resulting in the extirpation of this species from the wild.

The cumulative effects of years of river drying, downstream displacement, and habitat degradation continue to lead to the further decline of Rio Grande silvery minnow. The 2000 population monitoring study illustrates that low densities of individuals cannot be expected to withstand continued losses caused by river fragmentation and periods of discontinuous flow. The removal of instream barriers that prevent Rio Grande silvery minnow from reaching upstream reaches and the need to maintain flow throughout downstream reaches are paramount issues that need to be resolved for the continued persistence of this species.

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Table A-1. Collection localities for 2000 population monitoring of Rio Grande silvery minnow.

Site #	Site Locality
ANGOSTURA REACH SITES	
0	New Mexico, Sandoval County, Rio Grande, directly below Angostura Diversion Dam, Angostura. River Mile 209.7 SAN FELIPE PUEBLO QUADRANGLE UTM Easting: 363811 UTM Northing: 3916006 Zone: 13
1	New Mexico, Sandoval County, Rio Grande, at NM State Highway 44 bridge crossing, Bernalillo. River Mile 203.8 BERNALILLO QUADRANGLE UTM Easting: 358543 UTM Northing: 3909722 Zone: 13
2	New Mexico, Sandoval County, Rio Grande, ca. 4.0 miles downstream of NM State Highway 44 bridge crossing, at Rio Rancho Wastewater Treatment Plant, Rio Rancho. River Mile 200.0 BERNALILLO QUADRANGLE UTM Easting: 354772 UTM Northing: 3905355 Zone: 13
3	New Mexico, Bernalillo County, Rio Grande, at Central Avenue bridge crossing (US Highway 66), Albuquerque. River Mile 183.4 ALBUQUERQUE WEST QUADRANGLE UTM Easting: 346840 UTM Northing: 3884094 Zone: 13
4	New Mexico, Bernalillo County, Rio Grande, at Rio Bravo Boulevard bridge crossing, (NM State Highway 500), Albuquerque. River Mile 178.3 ALBUQUERQUE WEST QUADRANGLE UTM Easting: 347554 UTM Northing: 3877163 Zone: 13
ISLETA REACH SITES	
8	New Mexico, Valencia County, Rio Grande, ca. 1.0 miles upstream of NM State Highway 309/6 bridge crossing, Belen. River Mile 151.5 TOME QUADRANGLE UTM Easting: 339972 UTM Northing: 3837061 Zone: 13
9	New Mexico, Socorro County, Rio Grande, at US Highway 60 bridge crossing, Bernardo. River Mile 130.6 ABEYTAS QUADRANGLE UTM Easting: 334604 UTM Northing: 3809726 Zone: 13

Table A-1 (continued.). Collection localities for 2000 population monitoring of Rio Grande silvery minnow.

Site #	Site Locality
SAN ACACIA REACH SITES	
10	New Mexico, Socorro County, Rio Grande, directly below San Acacia Diversion Dam, San Acacia. River Mile 116.2 SAN ACACIA QUADRANGLE UTM Easting: 326162 UTM Northing: 3791977 Zone: 13
11	New Mexico, Socorro County, Rio Grande, ca. 1.5 miles downstream of San Acacia Diversion Dam, San Acacia. River Mile 114.6 LEMITAR QUADRANGLE UTM Easting: 325263 UTM Northing: 3790442 Zone: 13
12	New Mexico, Socorro County, Rio Grande, east of Socorro, 0.5 miles upstream of the Socorro Low Flow Conveyance Channel bridge; east and upstream of Socorro Wastewater Treatment Plant, Socorro. River Mile 99.5 LOMA DE LAS CANAS QUADRANGLE UTM Easting: 327097 UTM Northing: 3771043 Zone: 13
13	New Mexico, Socorro County, Rio Grande, ca. 4.0 miles upstream of US Highway 380 bridge crossing. River Mile 91.7 SAN ANTONIO QUADRANGLE UTM Easting: 328140 UTM Northing: 3761283 Zone: 13
14	New Mexico, Socorro County, Rio Grande, at US Highway 380 bridge crossing, San Antonio. River Mile 87.1 SAN ANTONIO QUADRANGLE UTM Easting: 328914 UTM Northing: 3754471 Zone: 13
15	New Mexico, Socorro County, Rio Grande, directly east of Bosque del Apache National Wildlife Refuge Headquarters. River Mile 79.1 SAN ANTONIO, SE QUADRANGLE UTM Easting: 327055 UTM Northing: 3740839 Zone: 13
16	New Mexico, Socorro County, Rio Grande, at San Marcial Railroad bridge crossing, San Marcial. River Mile 68.6 SAN MARCIAL QUADRANGLE UTM Easting: 315284 UTM Northing: 3728347 Zone: 13
17	New Mexico, Socorro County, Rio Grande, at its former confluence with the Low Flow Conveyance Channel; 16 miles downstream of the southern end of the Bosque del Apache National Wildlife Refuge; ca. 8 miles downstream of San Marcial Railroad bridge crossing. River Mile 60.5 PARAJE WELL QUADRANGLE UTM Easting: 309487 UTM Northing: 3718178 Zone: 13

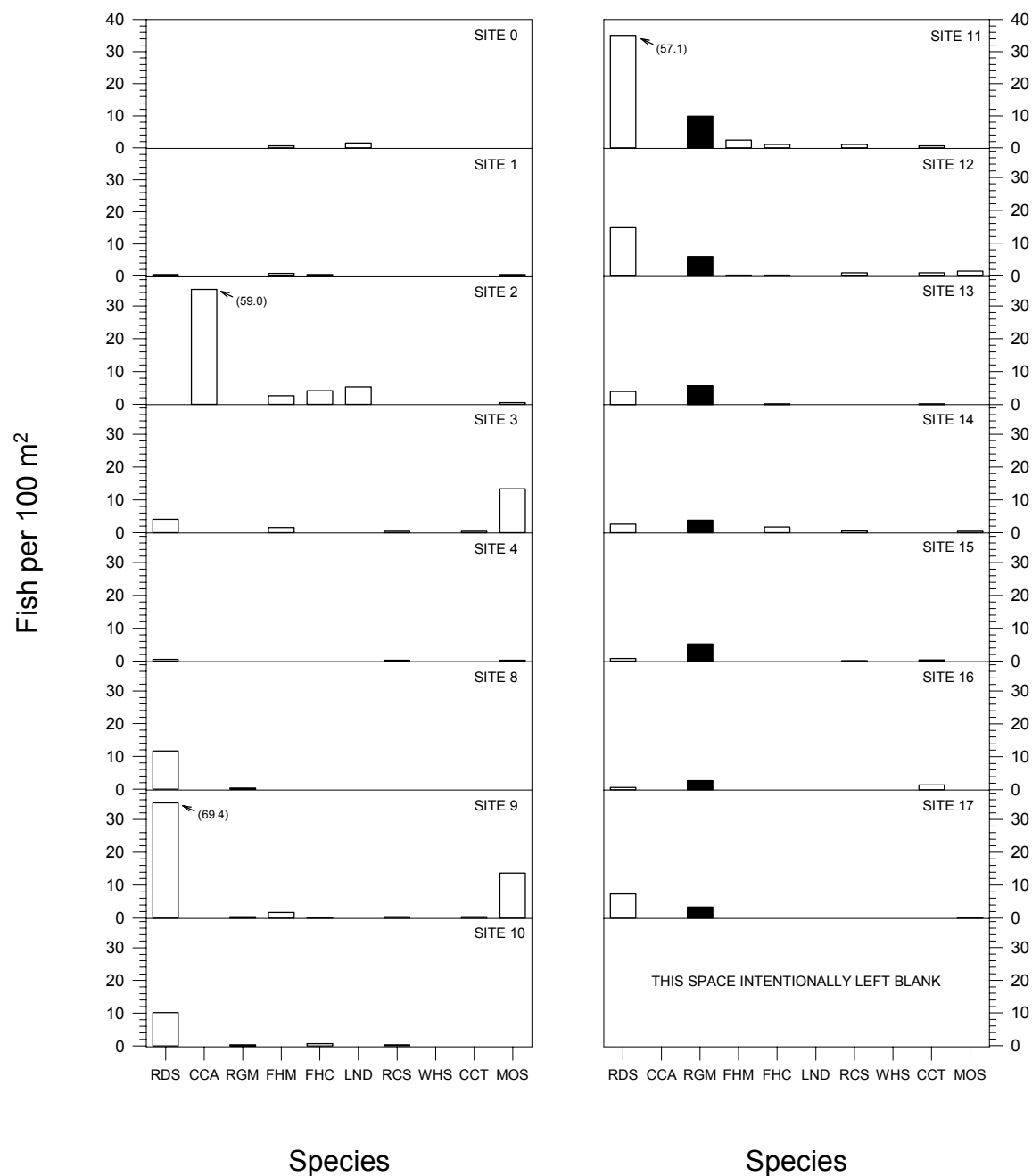


Figure A-1. Fish catch rates (CPUE) by collection locality for each focal species (see Table 1 for species abbreviations) in the Middle Rio Grande for February of 2000. Histogram bar for Rio Grande silvery minnow (RGM) is black to highlight this species.

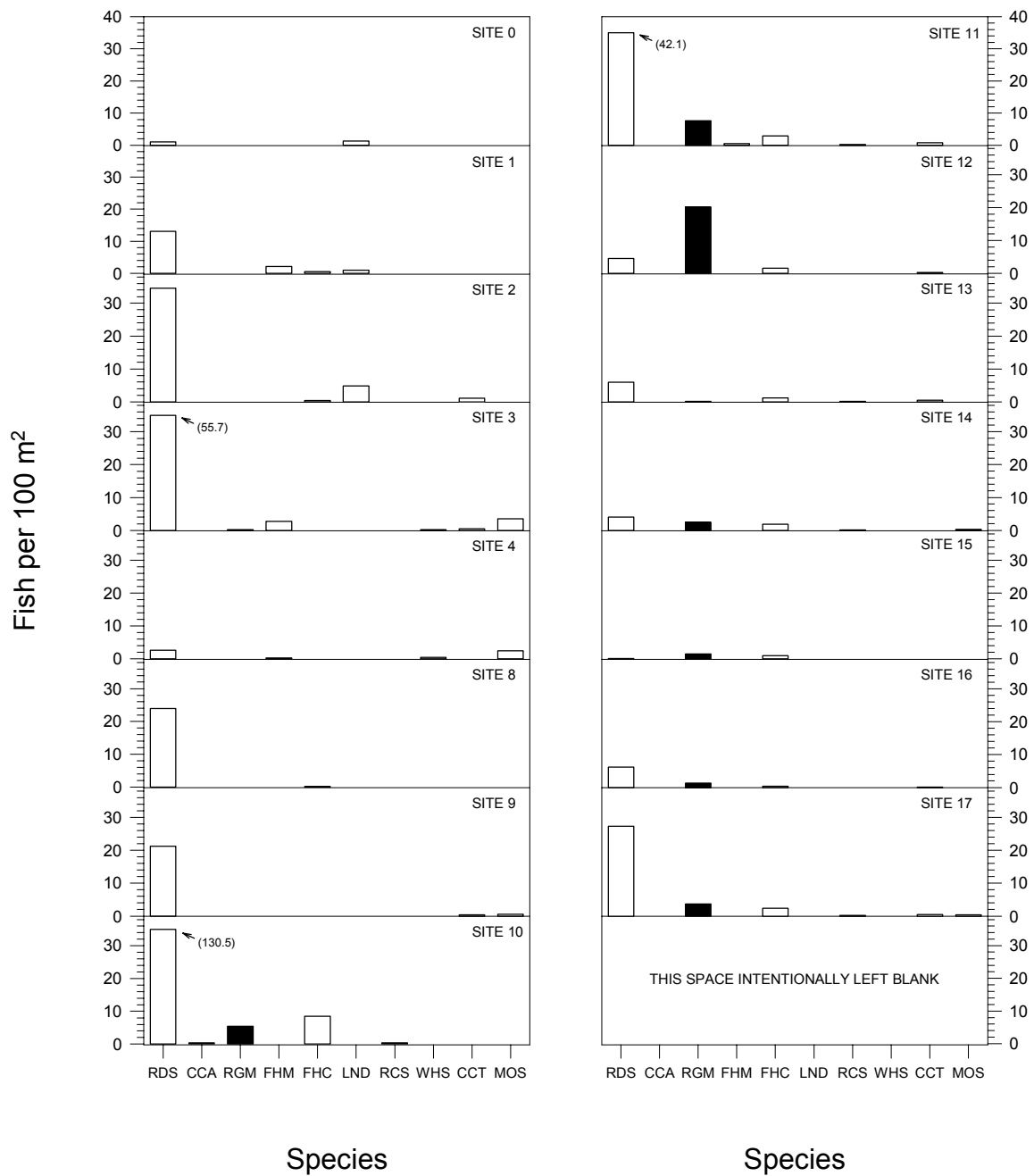


Figure A-2. Fish catch rates (CPUE) by collection locality for each focal species (see Table 1 for species abbreviations) in the Middle Rio Grande for April of 2000. Histogram bar for Rio Grande silvery minnow (RGM) is black to highlight this species.

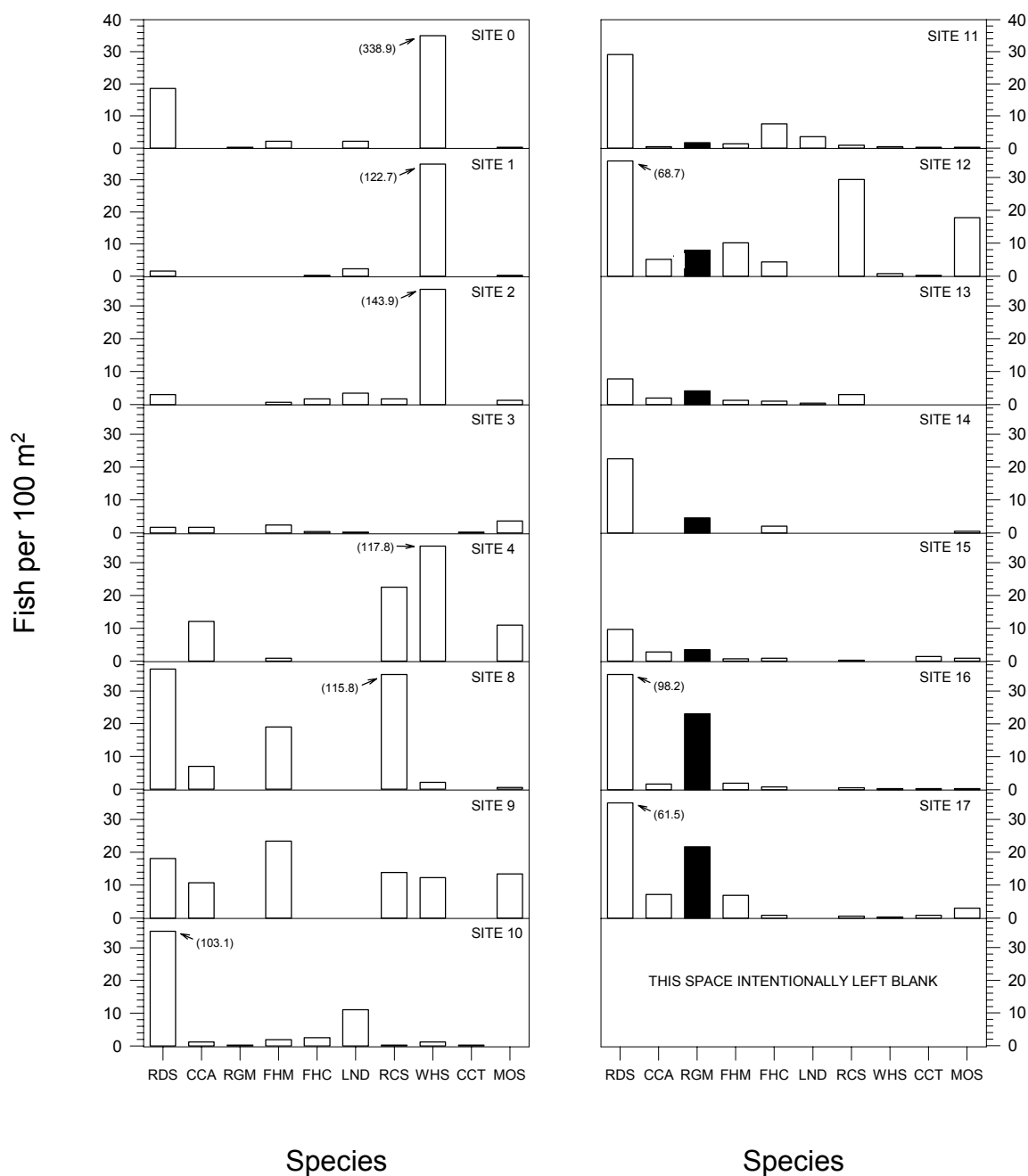


Figure A-3. Fish catch rates (CPUE) by collection locality for each focal species (see Table 1 for species abbreviations) in the Middle Rio Grande for June of 2000. Histogram bar for Rio Grande silvery minnow (RGM) is black to highlight this species.

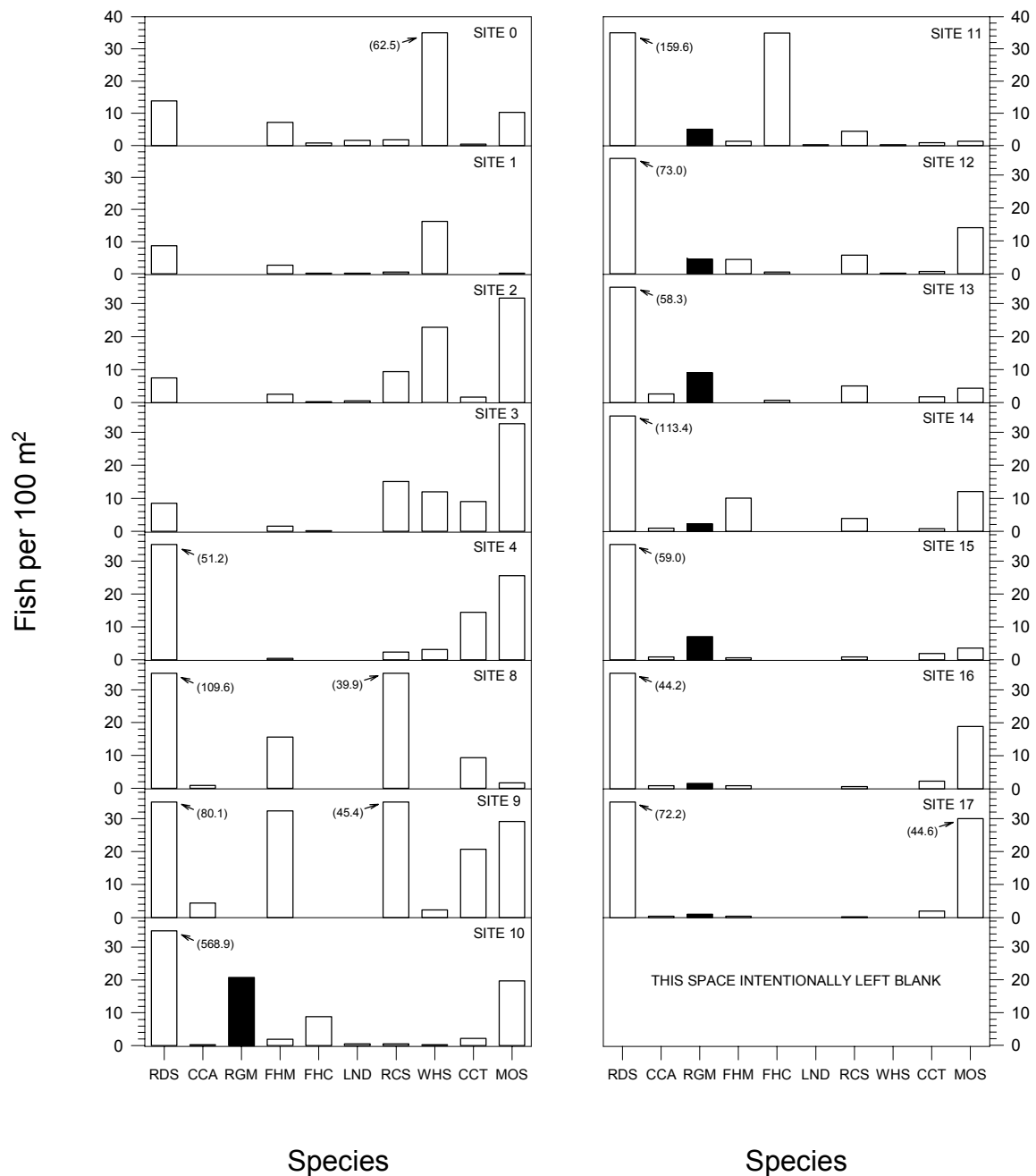


Figure A-4. Fish catch rates (CPUE) by collection locality for each focal species (see Table 1 for species abbreviations) in the Middle Rio Grande for August of 2000. Histogram bar for Rio Grande silvery minnow (RGM) is black to highlight this species.

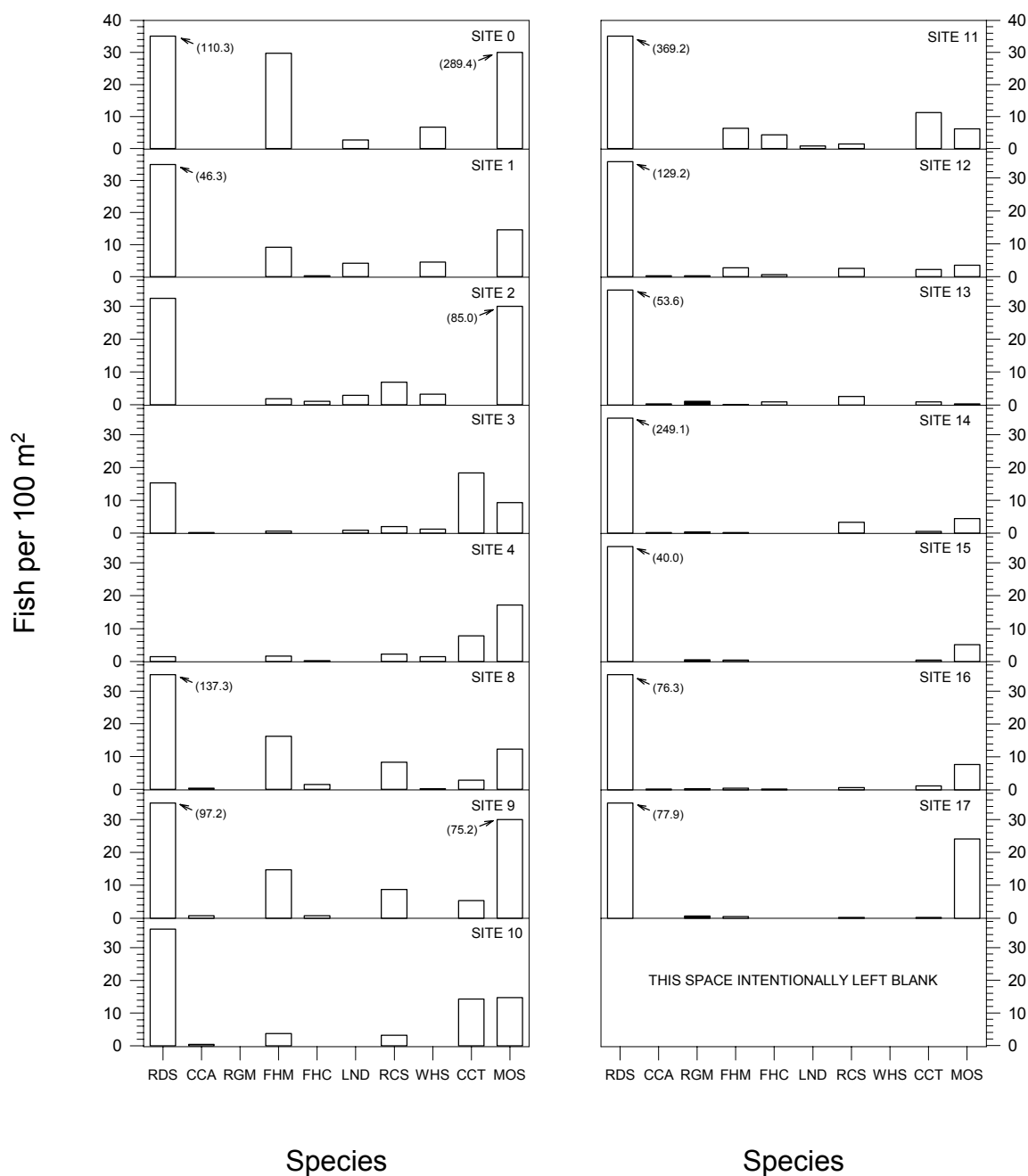


Figure A-5. Fish catch rates (CPUE) by collection locality for each focal species (see Table 1 for species abbreviations) in the Middle Rio Grande for October of 2000. Histogram bar for Rio Grande silvery minnow (RGM) is black to highlight this species.

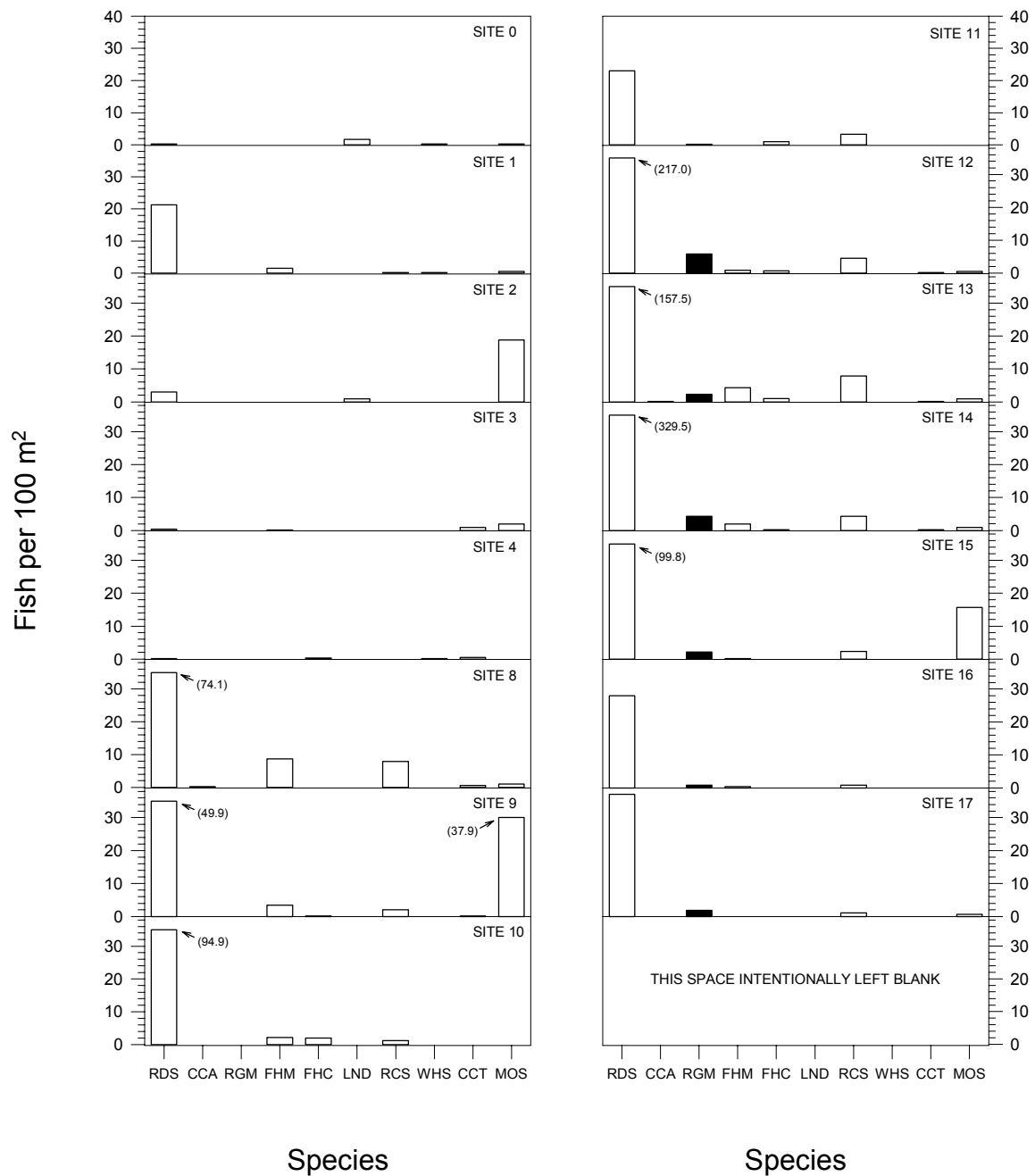


Figure A-6. Fish catch rates (CPUE) by collection locality for each focal species (see Table 1 for species abbreviations) in the Middle Rio Grande for December of 2000. Histogram bar for Rio Grande silvery minnow (RGM) is black to highlight this species.

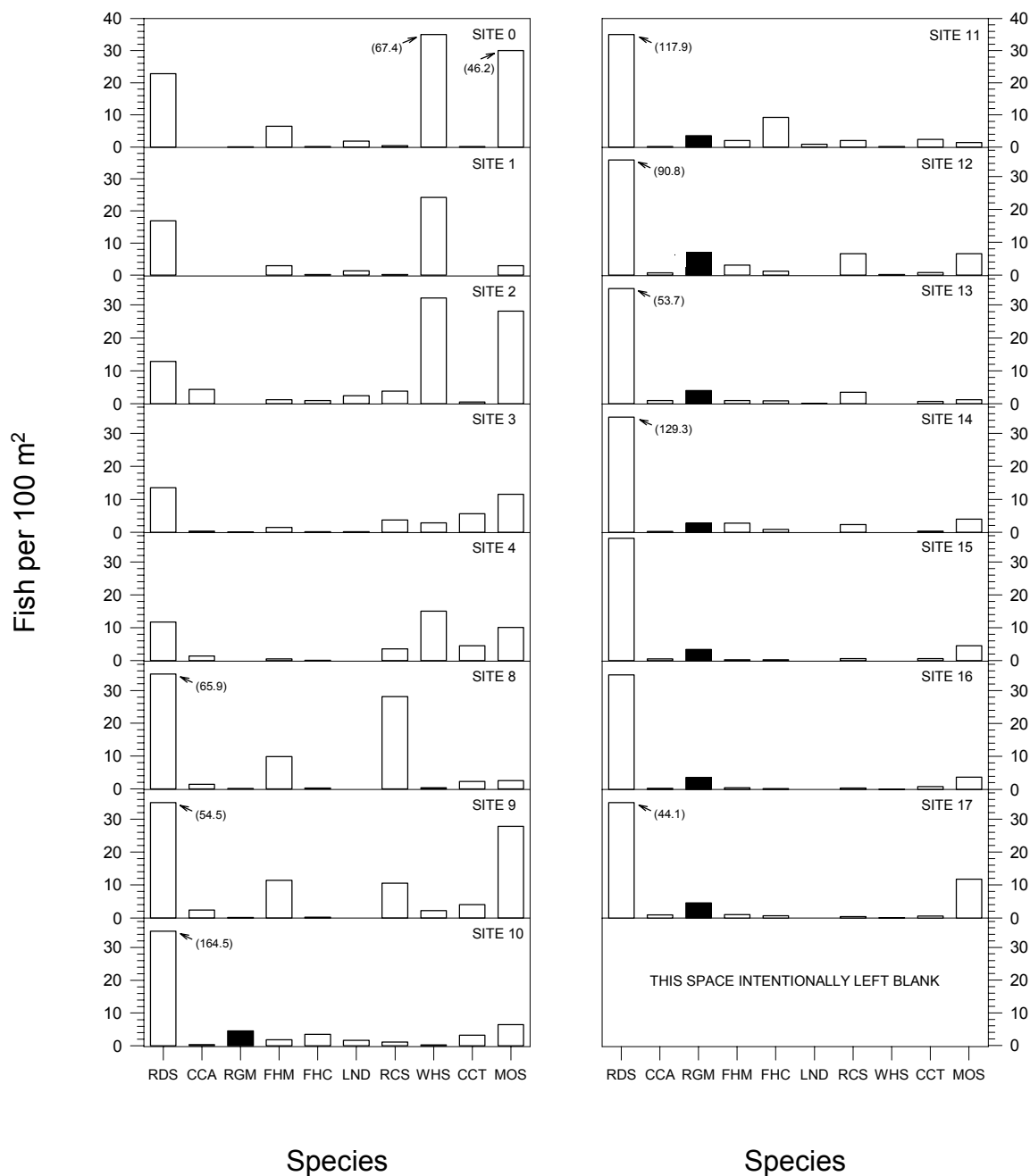


Figure A-7. Fish catch rates (CPUE) by collection locality for each focal species (see Table 1 for species abbreviations) in the Middle Rio Grande for all of 2000. Histogram bar for Rio Grande silvery minnow (RGM) is black to highlight this species.

Appendix B.
Ichthyofaunal composition of the 2000
Rio Grande silvery minnow population monitoring
collections

*** All data are provisional and should be verified by direct inspection of field data and specimens whenever possible***

Rio Grande silvery minnow Population Monitoring (February)

NEW MEXICO: SANDOVAL CO., RIO GRANDE DRAINAGE
Rio Grande, directly below Angostura Diversion Dam, Angostura.

18 February 2000

SPP00-009

RIVER MILE: 209.7

UTM EASTING: 363811 UTM NORTHING: 3916006 ZONE: 13

QUAD: San Felipe

R.K. Dudley, J.R. Walters, and M.A. Farrington

EFFORT: 331.7 m²

FAMILY

N

76	<i>Pimephales</i>	<i>promelas</i>	2
76	<i>Rhinichthys</i>	<i>cataractae</i>	5

NEW MEXICO: SANDOVAL CO., RIO GRANDE DRAINAGE
Rio Grande, at NM State HWY 44 bridge crossing, Bernalillo.

18 February 2000

SPP00-010

RIVER MILE: 203.8

UTM EASTING: 358543 UTM NORTHING: 3909722 ZONE: 13

QUAD: Bernalillo

R.K. Dudley, J.R. Walters, and M.A. Farrington

EFFORT: 254.7 m²

FAMILY

N

76	<i>Cyprinella</i>	<i>lutrensis</i>	1
76	<i>Pimephales</i>	<i>promelas</i>	2
76	<i>Platygobio</i>	<i>gracilis</i>	1
212	<i>Gambusia</i>	<i>affinis</i>	1

*** All data are provisional and should be verified by direct inspection of field data and specimens whenever possible***

Rio Grande silvery minnow Population Monitoring (February)

NEW MEXICO: SANDOVAL CO., RIO GRANDE DRAINAGE

Rio Grande, ca. 4.0 miles downstream of NM State HWY 44 bridge crossing, at Rio Rancho Wastewater Treatment Plant, Rio Rancho.

18 February 2000

SPP00-011

RIVER MILE: 200.0

UTM EASTING: 354772

UTM NORTHING: 3905355

ZONE: 13

QUAD: Bernalillo

R.K. Dudley, J.R. Walters, and M.A. Farrington

EFFORT: 189.7 m²

FAMILY			N
76	<i>Cyprinella</i>	<i>lutrensis</i>	112
76	<i>Pimephales</i>	<i>promelas</i>	5
76	<i>Platygobio</i>	<i>gracilis</i>	8
76	<i>Rhinichthys</i>	<i>cataractae</i>	10
212	<i>Gambusia</i>	<i>affinis</i>	1

NEW MEXICO: BERNALILLO CO., RIO GRANDE DRAINAGE

Rio Grande, at Central Avenue bridge crossing (US HWY 66), Albuquerque.

18 February 2000

SPP00-012

RIVER MILE: 183.4

UTM EASTING: 346840

UTM NORTHING: 3884094

ZONE: 13

QUAD: Albuquerque West

R.K. Dudley, J.R. Walters, and M.A. Farrington

EFFORT: 246.2 m²

FAMILY			N
76	<i>Cyprinella</i>	<i>lutrensis</i>	10
76	<i>Pimephales</i>	<i>promelas</i>	4
81	<i>Carpoides</i>	<i>carpio</i>	1
93	<i>Ictalurus</i>	<i>punctatus</i>	1
212	<i>Gambusia</i>	<i>affinis</i>	33

*** All data are provisional and should be verified by direct inspection of field data and specimens whenever possible***

Rio Grande silvery minnow Population Monitoring (February)

NEW MEXICO: BERNALILLO CO., RIO GRANDE DRAINAGE

Rio Grande, at Rio Bravo Blvd. bridge crossing (NM State HWY 500), Albuquerque.

23 February 2000

SPP00-017

RIVER MILE: 178.3

UTM EASTING: 347554

UTM NORTHING: 3877163

ZONE: 13

QUAD: Albuquerque West

R.K. Dudley, M.A. Farrington, and D.E. Gibson

EFFORT: 391.2 m²

FAMILY			N
76	<i>Cyprinella</i>	<i>lutrensis</i>	2
81	<i>Carpionodes</i>	<i>carpio</i>	1
212	<i>Gambusia</i>	<i>affinis</i>	1

NEW MEXICO: VALENCIA CO., RIO GRANDE DRAINAGE

Rio Grande, ca. 1.0 miles upstream of NM State HWY 309/6 bridge crossing, Belen.

23 February 2000

SPP00-018

RIVER MILE: 151.5

UTM EASTING: 339972

UTM NORTHING: 3837061

ZONE: 13

QUAD: Tome

R.K. Dudley, M.A. Farrington, and D.E. Gibson

EFFORT: 565.5 m²

FAMILY			N
76	<i>Cyprinella</i>	<i>lutrensis</i>	66
76	<i>Hybognathus</i>	<i>amarus</i> *	2

*** *Hybognathus amarus* by age class:**

age 1	2
-------	---

*** All data are provisional and should be verified by direct inspection of field data and specimens whenever possible***

Rio Grande silvery minnow Population Monitoring (February)

NEW MEXICO: SOCORRO CO., RIO GRANDE DRAINAGE
Rio Grande, at US HWY 60 bridge crossing, Bernardo.

23 February 2000

SPP00-019

RIVER MILE: 130.6

UTM EASTING: 334604 UTM NORTHING: 3809726 ZONE: 13

QUAD: Abeytas

R.K. Dudley, M.A. Farrington, and D.E. Gibson

EFFORT: 475.5 m²

FAMILY			N
76	<i>Cyprinella</i>	<i>lutrensis</i>	330
76	<i>Hybognathus</i>	<i>amarus</i> *	2
76	<i>Pimephales</i>	<i>promelas</i>	8
76	<i>Platygobio</i>	<i>gracilis</i>	1
81	<i>Carpiodes</i>	<i>carpio</i>	2
93	<i>Ictalurus</i>	<i>punctatus</i>	2
212	<i>Gambusia</i>	<i>affinis</i>	65

*** *Hybognathus amarus* by age class:**

age 1	2
-------	---

NEW MEXICO: SOCORRO CO., RIO GRANDE DRAINAGE

Rio Grande, directly below San Acacia Diversion Dam, San Acacia.

23 February 2000

SPP00-020

RIVER MILE: 116.2

UTM EASTING: 326162 UTM NORTHING: 3791977 ZONE: 13

QUAD: San Acacia

R.K. Dudley, M.A. Farrington, and D.E. Gibson

EFFORT: 294.7 m²

FAMILY			N
76	<i>Cyprinella</i>	<i>lutrensis</i>	30
76	<i>Hybognathus</i>	<i>amarus</i> *	1
76	<i>Platygobio</i>	<i>gracilis</i>	2
81	<i>Carpiodes</i>	<i>carpio</i>	1

*** *Hybognathus amarus* by age class:**

age 1	2
-------	---

*** All data are provisional and should be verified by direct inspection of field data and specimens whenever possible***

Rio Grande silvery minnow Population Monitoring (February)

NEW MEXICO: SOCORRO CO., RIO GRANDE DRAINAGE

Rio Grande, ca. 1.5 miles downstream of San Acacia Diversion Dam, San Acacia.

21 February 2000

SPP00-013

RIVER MILE: 114.6

UTM EASTING: 325263

UTM NORTHING: 3790442

ZONE: 13

QUAD: Lemitar

R.K. Dudley, M.A. Farrington, and D.E. Gibson

EFFORT: 294.5 m²

FAMILY			N
76	<i>Cyprinella</i>	<i>lutrensis</i>	168
76	<i>Hybognathus</i>	<i>amarus</i> *	29
76	<i>Pimephales</i>	<i>promelas</i>	7
76	<i>Platygobio</i>	<i>gracilis</i>	3
81	<i>Carpodes</i>	<i>carpio</i>	3
93	<i>Ictalurus</i>	<i>punctatus</i>	2

* *Hybognathus amarus* by age class:

age 1	29
-------	----

NEW MEXICO: SOCORRO CO., RIO GRANDE DRAINAGE

Rio Grande, east of Socorro, 0.5 miles upstream of Socorro Low Flow Conveyance Channel bridge;
east and just upstream of Socorro Wastewater Treatment Plant, Socorro.

21 February 2000

SPP00-014

RIVER MILE: 99.5

UTM EASTING: 327097

UTM NORTHING: 3771043

ZONE: 13

QUAD: San Antonio

R.K. Dudley, M.A. Farrington, and D.E. Gibson

EFFORT: 408.5 m²

FAMILY			N
76	<i>Cyprinella</i>	<i>lutrensis</i>	60
76	<i>Hybognathus</i>	<i>amarus</i> *	24
76	<i>Pimephales</i>	<i>promelas</i>	1
76	<i>Platygobio</i>	<i>gracilis</i>	1
81	<i>Carpodes</i>	<i>carpio</i>	4
93	<i>Ictalurus</i>	<i>punctatus</i>	4
212	<i>Gambusia</i>	<i>affinis</i>	6

* *Hybognathus amarus* by age class:

age 1	23
age 2	1

*** All data are provisional and should be verified by direct inspection of field data and specimens whenever possible***

Rio Grande silvery minnow Population Monitoring (February)

NEW MEXICO: SOCORRO CO., RIO GRANDE DRAINAGE

Rio Grande, ca. 4.0 miles upstream of U.S. HWY 380 bridge crossing.

21 February 2000

SPP00-015

RIVER MILE: 91.7

UTM EASTING: 328140 UTM NORTHING: 3761283 ZONE: 13

QUAD: San Antonio

R.K. Dudley, M.A. Farrington, and D.E. Gibson

EFFORT: 479.7 m²

FAMILY			N
76	<i>Cyprinella</i>	<i>lutrensis</i>	19
76	<i>Hybognathus</i>	<i>amarus</i>	27
76	<i>Platygobio</i>	<i>gracilis</i>	1
93	<i>Ictalurus</i>	<i>punctatus</i>	1

NEW MEXICO: SOCORRO CO., RIO GRANDE DRAINAGE

Rio Grande, at US HWY 380 bridge crossing, San Antonio.

21 February 2000

SPP00-016

RIVER MILE: 87.1

UTM EASTING: 328914 UTM NORTHING: 3754471 ZONE: 13

QUAD: San Antonio

R.K. Dudley, M.A. Farrington, and D.E. Gibson

EFFORT: 530.5 m²

FAMILY			N
76	<i>Cyprinella</i>	<i>lutrensis</i>	14
76	<i>Hybognathus</i>	<i>amarus</i> *	20
76	<i>Platygobio</i>	<i>gracilis</i>	9
81	<i>Carpodes</i>	<i>carpio</i>	3
212	<i>Gambusia</i>	<i>affinis</i>	2

*** *Hybognathus amarus* by age class:**

age 1	20
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*** All data are provisional and should be verified by direct inspection of field data and specimens whenever possible***

Rio Grande silvery minnow Population Monitoring (February)

NEW MEXICO: SOCORRO CO., RIO GRANDE DRAINAGE

Rio Grande, directly east of Bosque del Apache National Wildlife Refuge Headquarters.

24 February 2000

SPP00-023

RIVER MILE: 79.1

UTMEASTING: 327055 UTMNORTHING: 3740839 ZONE: 13

QUAD: San Antonio SE

R.K. Dudley, W.H. Brandenburg, and J.R. Walters

EFFORT: 545.2 m²

FAMILY			N
76	<i>Cyprinella</i>	<i>lutrensis</i>	5
76	<i>Hybognathus</i>	<i>amarus</i> *	32
81	<i>Carpodes</i>	<i>carpio</i>	1
93	<i>Ictalurus</i>	<i>punctatus</i>	2
* <i>Hybognathus amarus</i> by age class:			
		age 1	32

NEW MEXICO: SOCORRO CO., RIO GRANDE DRAINAGE

Rio Grande, at San Marcial Railroad bridge crossing, San Marcial.

24 February 2000

SPP00-022

RIVER MILE: 68.6

UTMEASTING: 315284 UTMNORTHING: 3728347 ZONE: 13

QUAD: Paraje Well

R.K. Dudley, W.H. Brandenburg, and J.R. Walters

EFFORT: 415.7 m²

FAMILY			N
76	<i>Cyprinella</i>	<i>lutrensis</i>	5
76	<i>Hybognathus</i>	<i>amarus</i> *	21
93	<i>Ictalurus</i>	<i>punctatus</i>	11
* <i>Hybognathus amarus</i> by age class:			
		age 1	20
		age 2	1

*** All data are provisional and should be verified by direct inspection of field data and specimens whenever possible***

Rio Grande silvery minnow Population Monitoring (February)

NEW MEXICO: SOCORRO CO., RIO GRANDE DRAINAGE

Rio Grande, at its former confluence with the Low Flow Conveyance Channel, 16.0 miles downstream of the southern end of Bosque del Apache National Wildlife Refuge; ca. 8 miles downstream of San Marcial Railroad bridge crossing.

24 February 2000

SPP00-021

RIVER MILE: 60.5

UTM EASTING: 309487 UTM NORTHING: 3718178 ZONE: 13

QUAD: Paraje Well

R.K. Dudley, W.H. Brandenburg, and J.R. Walters

EFFORT: 414 m²

FAMILY			N
76	<i>Cyprinella</i>	<i>lutrensis</i>	46
76	<i>Hybognathus</i>	<i>amarus</i> *	21
212	<i>Gambusia</i>	<i>affinis</i>	1
* <i>Hybognathus amarus</i> by age class:			
		age 1	21

*** All data are provisional and should be verified by direct inspection of field data and specimens whenever possible***

Rio Grande silvery minnow Population Monitoring (April)

NEW MEXICO: SANDOVAL CO., RIO GRANDE DRAINAGE
Rio Grande, directly below Angostura Diversion Dam, Angostura.

19 April 2000

SPP00-041

RIVER MILE: 209.7

UTM EASTING: 363811 UTM NORTHING: 3916006 ZONE: 13

QUAD: San Felipe Pueblo

R.K. Dudley, D.E. Gibson, and A.M. Snyder

EFFORT: 398.0 m²

FAMILY			N
76	<i>Cyprinella</i>	<i>lutrensis</i>	4
76	<i>Rhinichthys</i>	<i>cataractae</i>	5

NEW MEXICO: SANDOVAL CO., RIO GRANDE DRAINAGE
Rio Grande, at NM State HWY 44 bridge crossing, Bernalillo.

19 April 2000

SPP00-042

RIVER MILE: 203.8

UTM EASTING: 358543 UTM NORTHING: 3909722 ZONE: 13

QUAD: Bernalillo

R.K. Dudley, D.E. Gibson, and A.M. Snyder

EFFORT: 412.3 m²

FAMILY			N
76	<i>Cyprinella</i>	<i>lutrensis</i>	54
76	<i>Pimephales</i>	<i>promelas</i>	9
76	<i>Platygobio</i>	<i>gracilis</i>	2
76	<i>Rhinichthys</i>	<i>cataractae</i>	3

*** All data are provisional and should be verified by direct inspection of field data and specimens whenever possible***

Rio Grande silvery minnow Population Monitoring (April)

NEW MEXICO: SANDOVAL CO., RIO GRANDE DRAINAGE

Rio Grande, ca. 4.0 miles downstream of NM State HWY 44 bridge crossing, at Rio Rancho Wastewater Treatment Plant, Rio Rancho.

19 April 2000

SPP00-043

RIVER MILE: 200.0

UTM EASTING: 354772 UTM NORTHING: 3905355 ZONE: 13

QUAD: Bernalillo

R.K. Dudley, D.E. Gibson and A.M. Snyder

EFFORT: 269.0 m²

FAMILY			N
76	<i>Cyprinella</i>	<i>lutrensis</i>	94
76	<i>Platygobio</i>	<i>gracilis</i>	1
76	<i>Rhinichthys</i>	<i>cataractae</i>	13
93	<i>Ameiurus</i>	<i>natalis</i>	2
93	<i>Ictalurus</i>	<i>punctatus</i>	1

NEW MEXICO: BERNALILLO CO., RIO GRANDE DRAINAGE

Rio Grande, at Central Avenue bridge crossing (US HWY 66), Albuquerque.

19 April 2000

SPP00-044

RIVER MILE: 183.4

UTM EASTING: 346840 UTM NORTHING: 3884094 ZONE: 13

QUAD: Albuquerque West

R.K. Dudley, D.E. Gibson, and A.M. Snyder

EFFORT: 363.8 m²

FAMILY			N
76	<i>Cyprinella</i>	<i>lutrensis</i>	216
76	<i>Hybognathus</i>	<i>amarus</i>	1
76	<i>Pimephales</i>	<i>promelas</i>	10
81	<i>Catostomus</i>	<i>commersoni</i>	1
93	<i>Ictalurus</i>	<i>punctatus</i>	2
212	<i>Gambusia</i>	<i>affinis</i>	13

*** All data are provisional and should be verified by direct inspection of field data and specimens whenever possible***

Rio Grande silvery minnow Population Monitoring (April)

NEW MEXICO: BERNALILLO CO., RIO GRANDE DRAINAGE

Rio Grande, at Rio Bravo Blvd. bridge crossing (NM State HWY 500), Albuquerque.

24 April 2000

SPP00-053

RIVER MILE: 178.3

UTM EASTING: 347554 UTM NORTHING: 3877163 ZONE: 13

QUAD: Albuquerque West

R.K. Dudley, W.H. Brandenburg, and D.E. Gibson

EFFORT: 452.5 m²

FAMILY			N
76	<i>Cyprinella</i>	<i>lutrensis</i>	12
76	<i>Pimephales</i>	<i>promelas</i>	1
76	<i>Platygobio</i>	<i>gracilis</i>	1
81	<i>Catostomus</i>	<i>commersoni</i>	2
212	<i>Gambusia</i>	<i>affinis</i>	11

NEW MEXICO: VALENCIA CO., RIO GRANDE DRAINAGE

Rio Grande, ca. 1.0 miles upstream of NM State HWY 309/6 bridge crossing, Belen.

24 April 2000

SPP00-054

RIVER MILE: 151.5

UTM EASTING: 339972 UTM NORTHING: 3837061 ZONE: 13

QUAD: Tome

R.K. Dudley, W.H. Brandenburg, and D.E. Gibson

EFFORT: 567.3 m²

FAMILY			N
76	<i>Cyprinella</i>	<i>lutrensis</i>	136
76	<i>Platygobio</i>	<i>gracilis</i>	1

*** All data are provisional and should be verified by direct inspection of field data and specimens whenever possible***

Rio Grande silvery minnow Population Monitoring (April)

NEW MEXICO: SOCORRO CO., RIO GRANDE DRAINAGE

Rio Grande, at US HWY 60 bridge crossing, Bernardo.

24 April 2000

SPP00-055

RIVER MILE: 130.6

UTMEASTING: 334604 UTMNORTHING: 3809726 ZONE: 13

QUAD: Abeytas

R.K. Dudley, W.H. Brandenburg, and D.E. Gibson

EFFORT: 529.3 m²

FAMILY			N
76	<i>Cyprinella</i>	<i>lutrensis</i>	112
93	<i>Ictalurus</i>	<i>punctatus</i>	2
212	<i>Gambusia</i>	<i>affinis</i>	3

NEW MEXICO: SOCORRO CO., RIO GRANDE DRAINAGE

Rio Grande, directly below San Acacia Diversion Dam, San Acacia.

21 April 2000

SPP00-049

RIVER MILE: 116.2

UTMEASTING: 326162 UTMNORTHING: 3791977 ZONE: 13

QUAD: San Acacia

R.K. Dudley, D.E. Gibson, and A.M. Snyder

EFFORT: 259.0 m²

FAMILY			N
76	<i>Cyprinella</i>	<i>lutrensis</i>	338
76	<i>Hybognathus</i>	<i>amarus</i>	14
76	<i>Platygobio</i>	<i>gracilis</i>	22
81	<i>Carpodes</i>	<i>carpio</i>	1

*** All data are provisional and should be verified by direct inspection of field data and specimens whenever possible***

Rio Grande silvery minnow Population Monitoring (April)

NEW MEXICO: SOCORRO CO., RIO GRANDE DRAINAGE

Rio Grande, ca. 1.5 miles downstream of San Acacia Diversion Dam, San Acacia.

21 April 2000

SPP00-050

RIVER MILE: 114.6

UTM EASTING: 325263 UTM NORTHING: 3790442 ZONE: 13

QUAD: Lemitar

R.K. Dudley, D.E. Gibson, and A.M. Snyder

EFFORT: 385.0 m²

FAMILY			N
76	<i>Cyprinella</i>	<i>lutrensis</i>	162
76	<i>Hybognathus</i>	<i>amarus</i>	29
76	<i>Pimephales</i>	<i>promelas</i>	2
76	<i>Platygobio</i>	<i>gracilis</i>	11
81	<i>Carpoides</i>	<i>carpio</i>	1
93	<i>Ictalurus</i>	<i>punctatus</i>	3

NEW MEXICO: SOCORRO CO., RIO GRANDE DRAINAGE

Rio Grande, east of Socorro, 0.5 miles upstream of Socorro Low Flow Conveyance Channel bridge;
east and just upstream of Socorro Wastewater Treatment Plant, Socorro.

21 April 2000

SPP00-051

RIVER MILE: 99.5

UTM EASTING: 327097 UTM NORTHING: 3771043 ZONE: 13

QUAD: Loma de las Canas

R.K. Dudley, D.E. Gibson, and A.M. Snyder

EFFORT: 442.0 m²

FAMILY			N
76	<i>Cyprinella</i>	<i>lutrensis</i>	20
76	<i>Hybognathus</i>	<i>amarus</i>	88
76	<i>Platygobio</i>	<i>gracilis</i>	7
93	<i>Ictalurus</i>	<i>punctatus</i>	1

*** All data are provisional and should be verified by direct inspection of field data and specimens whenever possible***

Rio Grande silvery minnow Population Monitoring (April)

NEW MEXICO: SOCORRO CO., RIO GRANDE DRAINAGE

Rio Grande, ca. 4.0 miles upstream of U.S. 380 HWY bridge crossing.

21 April 2000

SPP00-052

RIVER MILE: 91.7

UTMEASTING: 328140 UTMNORTHING: 3761283 ZONE: 13

QUAD: San Antonio

R.K. Dudley, D.E. Gibson, and A.M. Snyder

EFFORT: 547.3 m²

FAMILY			N
76	<i>Cyprinella</i>	<i>lutrensis</i>	33
76	<i>Hybognathus</i>	<i>amarus</i>	1
76	<i>Platygobio</i>	<i>gracilis</i>	7
81	<i>Carpiodes</i>	<i>carpio</i>	1
93	<i>Ictalurus</i>	<i>punctatus</i>	3

NEW MEXICO: SOCORRO CO., RIO GRANDE DRAINAGE

Rio Grande, at US HWY 380 bridge crossing, San Antonio.

20 April 2000

SPP00-048

RIVER MILE: 87.1

UTMEASTING: 328914 UTMNORTHING: 3754471 ZONE: 13

QUAD: San Antonio

S.P. Platania, R.K. Dudley, and D.E. Gibson

EFFORT: 648.5 m²

FAMILY			N
76	<i>Cyprinella</i>	<i>lutrensis</i>	26
76	<i>Hybognathus</i>	<i>amarus</i>	16
76	<i>Platygobio</i>	<i>gracilis</i>	12
81	<i>Carpiodes</i>	<i>carpio</i>	1
212	<i>Gambusia</i>	<i>affinis</i>	2

*** All data are provisional and should be verified by direct inspection of field data and specimens whenever possible***

Rio Grande silvery minnow Population Monitoring (April)

NEW MEXICO: SOCORRO CO., RIO GRANDE DRAINAGE

Rio Grande, directly east of Bosque del Apache National Wildlife Refuge Headquarters.

20 April 2000

SPP00-047

RIVER MILE: 79.1

UTM EASTING: 327055 UTM NORTHING: 3740839 ZONE: 13

QUAD: San Antonio SE

S.P. Platania, R.K. Dudley, and D.E. Gibson

EFFORT: 613.5 m²

FAMILY			N
76	<i>Cyprinella</i>	<i>lutrensis</i>	1
76	<i>Hybognathus</i>	<i>amarus</i>	9
76	<i>Platygobio</i>	<i>gracilis</i>	6

NEW MEXICO: SOCORRO CO., RIO GRANDE DRAINAGE

Rio Grande, at San Marcial Railroad Crossing, San Marcial.

20 April 2000

SPP00-046

RIVER MILE: 68.6

UTM EASTING: 315284 UTM NORTHING: 3728347 ZONE: 13

QUAD: San Marcial

S.P. Platania, R.K. Dudley, and D.E. Gibson

EFFORT: 762.3 m²

FAMILY			N
76	<i>Cyprinella</i>	<i>lutrensis</i>	47
76	<i>Hybognathus</i>	<i>amarus</i>	10
76	<i>Platygobio</i>	<i>gracilis</i>	3
93	<i>Ictalurus</i>	<i>punctatus</i>	1

*** All data are provisional and should be verified by direct inspection of field data and specimens whenever possible***

Rio Grande silvery minnow Population Monitoring (April)

NEW MEXICO: SOCORRO CO., RIO GRANDE DRAINAGE

Rio Grande, at its former confluence with the Low Flow Conveyance Channel, 16.0 miles downstream of the southern end of Bosque del Apache National Wildlife Refuge; ca. 8 miles downstream of San Marcial Railroad bridge crossing.

20 April 2000

SPP00-045

RIVER MILE: 60.5

UTM EASTING: 309487

UTM NORTHING: 3718178

ZONE: 13

QUAD: Paraje Well

S.P. Platania, R.K. Dudley, and D.E. Gibson

EFFORT: 627.5 m²

FAMILY

76	<i>Cyprinella</i>	<i>lutrensis</i>	171
76	<i>Hybognathus</i>	<i>amarus</i>	13
76	<i>Platygobio</i>	<i>gracilis</i>	15
81	<i>Carpodes</i>	<i>carpio</i>	1
93	<i>Ictalurus</i>	<i>punctatus</i>	3

*** All data are provisional and should be verified by direct inspection of field data and specimens whenever possible***

Rio Grande silvery minnow Population Monitoring (June)

NEW MEXICO: SANDOVAL CO., RIO GRANDE DRAINAGE
Rio Grande, directly below Angostura Diversion Dam, Angostura.

08 June 2000

SPP00-076

RIVER MILE: 209.7

UTM EASTING: 363811 UTM NORTHING: 3916006 ZONE: 13

QUAD: San Felipe Pueblo

R.K. Dudley, W.H. Brandenburg, R.B. Romero, and C.C. McBride

EFFORT: 388.0 m²

FAMILY			N
76	<i>Cyprinella</i>	<i>lutrensis</i>	72
76	<i>Hybognathus</i>	<i>amarus</i>	1
76	<i>Pimephales</i>	<i>promelas</i>	8
76	<i>Rhinichthys</i>	<i>cataractae</i>	8
81	<i>Catostomus</i>	<i>commersoni</i>	1315
212	<i>Gambusia</i>	<i>affinis</i>	1

NEW MEXICO: SANDOVAL CO., RIO GRANDE DRAINAGE
Rio Grande, at NM State HWY 44 bridge crossing, Bernalillo.

08 June 2000

SPP00-077

RIVER MILE: 203.8

UTM EASTING: 358543 UTM NORTHING: 3909722 ZONE: 13

QUAD: Bernalillo

R.K. Dudley, W.H. Brandenburg, R.B. Romero, and C.C. McBride

EFFORT: 440.0 m²

FAMILY			N
76	<i>Cyprinella</i>	<i>lutrensis</i>	7
76	<i>Platygobio</i>	<i>gracilis</i>	1
76	<i>Rhinichthys</i>	<i>cataractae</i>	10
81	<i>Catostomus</i>	<i>commersoni</i>	540
212	<i>Gambusia</i>	<i>affinis</i>	1

*** All data are provisional and should be verified by direct inspection of field data and specimens whenever possible***

Rio Grande silvery minnow Population Monitoring (June)

NEW MEXICO: SANDOVAL CO., RIO GRANDE DRAINAGE

Rio Grande, ca. 4.0 miles downstream of NM State HWY 44 bridge crossing, at Rio Rancho Wastewater Treatment Plant, Rio Rancho.

08 June 2000

SPP00-078

RIVER MILE: 200.0

UTM EASTING: 354772 UTM NORTHING: 3905355 ZONE: 13

QUAD: Bernalillo

R.K. Dudley, W.H. Brandenburg, R.B. Romero, and C.C. McBride

EFFORT: 465.0 m²

FAMILY			N
76	<i>Cyprinella</i>	<i>lutrensis</i>	14
76	<i>Pimephales</i>	<i>promelas</i>	3
76	<i>Platygobio</i>	<i>gracilis</i>	8
76	<i>Rhinichthys</i>	<i>cataractae</i>	16
81	<i>Carpiodes</i>	<i>carpio</i>	8
81	<i>Catostomus</i>	<i>commersoni</i>	669
212	<i>Gambusia</i>	<i>affinis</i>	6

NEW MEXICO: BERNALILLO CO., RIO GRANDE DRAINAGE

Rio Grande, at Central Avenue bridge crossing (US HWY 66), Albuquerque.

08 June 2000

SPP00-079

RIVER MILE: 183.4

UTM EASTING: 346840 UTM NORTHING: 3884094 ZONE: 13

QUAD: Albuquerque West

R.K. Dudley, W.H. Brandenburg, R.B. Romero, and C.C. McBride

EFFORT: 463.0 m²

FAMILY			N
76	<i>Cyprinella</i>	<i>lutrensis</i>	8
76	<i>Cyprinus</i>	<i>carpio</i>	8
76	<i>Pimephales</i>	<i>promelas</i>	11
76	<i>Platygobio</i>	<i>gracilis</i>	2
76	<i>Rhinichthys</i>	<i>cataractae</i>	1
81	<i>Catostomus</i>	<i>commersoni</i>	180
93	<i>Ameiurus</i>	<i>natalis</i>	1
93	<i>Ictalurus</i>	<i>punctatus</i>	1
212	<i>Gambusia</i>	<i>affinis</i>	17
294	<i>Micropterus</i>	<i>salmoides</i>	4

*** All data are provisional and should be verified by direct inspection of field data and specimens whenever possible***

Rio Grande silvery minnow Population Monitoring (June)

NEW MEXICO: BERNALILLO CO., RIO GRANDE DRAINAGE

Rio Grande, at Rio Bravo Blvd. bridge crossing (NM State HWY 500), Albuquerque.

09 June 2000

SPP00-082

RIVER MILE: 178.3

UTMEASTING: 347554

UTMNORTHING: 3877163

ZONE: 13

QUAD: Albuquerque West

R.K. Dudley, W.H. Brandenburg, and D.E. Gibson

EFFORT: 354.8 m²

FAMILY			N
76	<i>Cyprinus</i>	<i>carpio</i>	43
76	<i>Pimephales</i>	<i>promelas</i>	3
81	<i>Carpiodes</i>	<i>carpio</i>	80
81	<i>Catostomus</i>	<i>commersoni</i>	418
93	<i>Ameiurus</i>	<i>natalis</i>	2
212	<i>Gambusia</i>	<i>affinis</i>	39
294	<i>Micropterus</i>	<i>salmoides</i>	2

NEW MEXICO: VALENCIA CO., RIO GRANDE DRAINAGE

Rio Grande, ca. 1.0 miles upstream of NM State HWY 309/6 bridge crossing, Belen.

09 June 2000

SPP00-080

RIVER MILE: 151.5

UTMEASTING: 339972

UTMNORTHING: 3837061

ZONE: 13

QUAD: Tome

R.K. Dudley, W.H. Brandenburg, and D.E. Gibson

EFFORT: 520.8 m²

FAMILY			N
76	<i>Cyprinella</i>	<i>lutrensis</i>	189
76	<i>Cyprinus</i>	<i>carpio</i>	36
76	<i>Pimephales</i>	<i>promelas</i>	99
81	<i>Carpiodes</i>	<i>carpio</i>	602
81	<i>Catostomus</i>	<i>commersoni</i>	11
93	<i>Ameiurus</i>	<i>natalis</i>	11
212	<i>Gambusia</i>	<i>affinis</i>	3
294	<i>Micropterus</i>	<i>salmoides</i>	1

*** All data are provisional and should be verified by direct inspection of field data and specimens whenever possible***

Rio Grande silvery minnow Population Monitoring (June)

NEW MEXICO: SOCORRO CO., RIO GRANDE DRAINAGE

Rio Grande, at US HWY 60 bridge crossing, Bernardo.

09 June 2000

SPP00-081

RIVER MILE: 130.6

UTMEASTING: 334604 UTMNORTHING: 3809726 ZONE: 13

QUAD: Abeytas

R.K. Dudley, W.H. Brandenburg, and D.E. Gibson

EFFORT: 448.3 m²

FAMILY			N
76	<i>Cyprinella</i>	<i>lutrensis</i>	81
76	<i>Cyprinus</i>	<i>carpio</i>	47
76	<i>Pimephales</i>	<i>promelas</i>	105
81	<i>Carpiodes</i>	<i>carpio</i>	62
81	<i>Catostomus</i>	<i>commersoni</i>	55
93	<i>Ameiurus</i>	<i>natalis</i>	4
212	<i>Gambusia</i>	<i>affinis</i>	60

NEW MEXICO: SOCORRO CO., RIO GRANDE DRAINAGE

Rio Grande, directly below San Acacia Diversion Dam, San Acacia.

21 June 2000

SPP00-083

RIVER MILE: 116.2

UTMEASTING: 326162 UTMNORTHING: 3791977 ZONE: 13

QUAD: San Acacia

R.K. Dudley, C.C. McBride, and B.C. Tonihka

EFFORT: 316.3 m²

FAMILY			N
76	<i>Cyprinella</i>	<i>lutrensis</i>	326
76	<i>Cyprinus</i>	<i>carpio</i>	4
76	<i>Hybognathus</i>	<i>amarus</i>	1
76	<i>Pimephales</i>	<i>promelas</i>	6
76	<i>Platygobio</i>	<i>gracilis</i>	8
76	<i>Rhinichthys</i>	<i>cataractae</i>	35
81	<i>Carpiodes</i>	<i>carpio</i>	1
81	<i>Catostomus</i>	<i>commersoni</i>	4
93	<i>Ictalurus</i>	<i>punctatus</i>	1
295	<i>Stizostedion</i>	<i>vitreum</i>	1

*** All data are provisional and should be verified by direct inspection of field data and specimens whenever possible***

Rio Grande silvery minnow Population Monitoring (June)

NEW MEXICO: SOCORRO CO., RIO GRANDE DRAINAGE

Rio Grande, ca. 1.5 miles downstream of San Acacia Diversion Dam, San Acacia.

21 June 2000

SPP00-084

RIVER MILE: 114.6

UTM EASTING: 325263 UTM NORTHING: 3790442 ZONE: 13

QUAD: Lemitar

R.K. Dudley, C.C. McBride, and B.C. Tonihka

EFFORT: 480.5 m²

FAMILY			N
76	<i>Cyprinella</i>	<i>lutrensis</i>	140
76	<i>Cyprinus</i>	<i>carpio</i>	2
76	<i>Hybognathus</i>	<i>amarus</i>	8
76	<i>Pimephales</i>	<i>promelas</i>	6
76	<i>Platygobio</i>	<i>gracilis</i>	36
76	<i>Rhinichthys</i>	<i>cataractae</i>	17
81	<i>Carpodes</i>	<i>carpio</i>	4
81	<i>Catostomus</i>	<i>commersoni</i>	2
93	<i>Ictalurus</i>	<i>punctatus</i>	1
212	<i>Gambusia</i>	<i>affinis</i>	1

NEW MEXICO: SOCORRO CO., RIO GRANDE DRAINAGE

Rio Grande, east of Socorro, 0.5 miles upstream of Socorro Low Flow Conveyance Channel bridge;
east and just upstream of Socorro Wastewater Treatment Plant, Socorro.

21 June 2000

SPP00-085

RIVER MILE: 99.5

UTM EASTING: 327097 UTM NORTHING: 3771043 ZONE: 13

QUAD: San Antonio

R.K. Dudley, C.C. McBride, and B.C. Tonihka

EFFORT: 394.8 m²

FAMILY			N
76	<i>Cyprinella</i>	<i>lutrensis</i>	271
76	<i>Cyprinus</i>	<i>carpio</i>	20
76	<i>Hybognathus</i>	<i>amarus</i>	31
76	<i>Pimephales</i>	<i>promelas</i>	40
76	<i>Platygobio</i>	<i>gracilis</i>	17
81	<i>Carpodes</i>	<i>carpio</i>	116
81	<i>Catostomus</i>	<i>commersoni</i>	3
93	<i>Ictalurus</i>	<i>punctatus</i>	1
212	<i>Gambusia</i>	<i>affinis</i>	70

*** All data are provisional and should be verified by direct inspection of field data and specimens whenever possible***

Rio Grande silvery minnow Population Monitoring (June)

NEW MEXICO: SOCORRO CO., RIO GRANDE DRAINAGE

Rio Grande, ca. 4.0 miles upstream of U.S. 380 HWY bridge crossing.

21 June 2000

SPP00-086

RIVER MILE: 91.7

UTM EASTING: 328140 UTM NORTHING: 3761283 ZONE: 13

QUAD: San Antonio

R.K. Dudley, C.C. McBride, and B.C. Tonihka

EFFORT: 459.8 m²

FAMILY			N
76	<i>Cyprinella</i>	<i>lutrensis</i>	36
76	<i>Cyprinus</i>	<i>carpio</i>	9
76	<i>Pimephales</i>	<i>promelas</i>	6
76	<i>Platygobio</i>	<i>gracilis</i>	5
76	<i>Rhinichthys</i>	<i>cataractae</i>	2
81	<i>Carpiodes</i>	<i>carpio</i>	14

NEW MEXICO: SOCORRO CO., RIO GRANDE DRAINAGE

Rio Grande, at US HWY 380 bridge crossing, San Antonio.

22 June 2000

SPP00-090

RIVER MILE: 87.1

UTM EASTING: 328914 UTM NORTHING: 3754471 ZONE: 13

QUAD: San Antonio

R.K. Dudley, C.C. McBride, and B.C. Tonihka

EFFORT: 200.0 m²

FAMILY			N
76	<i>Cyprinella</i>	<i>lutrensis</i>	45
76	<i>Hybognathus</i>	<i>amarus</i>	9
76	<i>Platygobio</i>	<i>gracilis</i>	4
212	<i>Gambusia</i>	<i>affinis</i>	1

*** All data are provisional and should be verified by direct inspection of field data and specimens whenever possible***

Rio Grande silvery minnow Population Monitoring (June)

NEW MEXICO: SOCORRO CO., RIO GRANDE DRAINAGE

Rio Grande, directly east of Bosque del Apache National Wildlife Refuge Headquarters.

22 June 2000

SPP00-089

RIVER MILE: 79.1

UTM EASTING: 327055 UTM NORTHING: 3740839 ZONE: 13

QUAD: San Antonio SE

R.K. Dudley, C.C. McBride, and B.C. Tonihka

EFFORT: 426.8 m²

FAMILY			N
76	<i>Cyprinella</i>	<i>lutrensis</i>	41
76	<i>Cyprinus</i>	<i>carpio</i>	12
76	<i>Hybognathus</i>	<i>amarus</i>	15
76	<i>Pimephales</i>	<i>promelas</i>	3
76	<i>Platygobio</i>	<i>gracilis</i>	4
81	<i>Carpiodes</i>	<i>carpio</i>	1
93	<i>Ictalurus</i>	<i>punctatus</i>	4
212	<i>Gambusia</i>	<i>affinis</i>	4

NEW MEXICO: SOCORRO CO., RIO GRANDE DRAINAGE

Rio Grande, at San Marcial Railroad bridge crossing, San Marcial.

22 June 2000

SPP00-088

RIVER MILE: 68.6

UTM EASTING: 315284 UTM NORTHING: 3728347 ZONE: 13

QUAD: San Marcial

R.K. Dudley, C.C. McBride, and B.C. Tonihka

EFFORT: 351.3 m²

FAMILY			N
76	<i>Cyprinella</i>	<i>lutrensis</i>	345
76	<i>Cyprinus</i>	<i>carpio</i>	6
76	<i>Hybognathus</i>	<i>amarus</i>	81
76	<i>Pimephales</i>	<i>promelas</i>	7
76	<i>Platygobio</i>	<i>gracilis</i>	3
81	<i>Carpiodes</i>	<i>carpio</i>	2
81	<i>Catostomus</i>	<i>commersoni</i>	1
93	<i>Ictalurus</i>	<i>punctatus</i>	1
212	<i>Gambusia</i>	<i>affinis</i>	1

*** All data are provisional and should be verified by direct inspection of field data and specimens whenever possible***

Rio Grande silvery minnow Population Monitoring (June)

NEW MEXICO: SOCORRO CO., RIO GRANDE DRAINAGE

Rio Grande, at its former confluence with the Low Flow Conveyance Channel, 16.0 miles downstream of the southern end of Bosque del Apache National Wildlife Refuge; ca. 8 miles downstream of San Marcial Railroad bridge crossing.

22 June 2000

SPP00-087

RIVER MILE: 60.5

UTM EASTING: 309487 UTM NORTHING: 3718178 ZONE: 13

QUAD: Paraje Well

R.K. Dudley, C.C. McBride, and B.C. Tonihka

EFFORT: 360.8 m²

FAMILY			N
76	<i>Cyprinella</i>	<i>lutrensis</i>	222
76	<i>Cyprinus</i>	<i>carpio</i>	26
76	<i>Hybognathus</i>	<i>amarus</i>	78
76	<i>Pimephales</i>	<i>promelas</i>	25
76	<i>Platygobio</i>	<i>gracilis</i>	3
81	<i>Carpiodes</i>	<i>carpio</i>	2
81	<i>Catostomus</i>	<i>commersoni</i>	1
93	<i>Ictalurus</i>	<i>punctatus</i>	3
212	<i>Gambusia</i>	<i>affinis</i>	11
294	<i>Micropterus</i>	<i>salmoides</i>	2

*** All data are provisional and should be verified by direct inspection of field data and specimens whenever possible***

Rio Grande silvery minnow Population Monitoring (August)

NEW MEXICO: SANDOVAL CO., RIO GRANDE DRAINAGE
Rio Grande, directly below Angostura Diversion Dam, Angostura.

15 August 2000

SPP00-124

RIVER MILE: 209.7

UTM EASTING: 363811 UTM NORTHING: 3916006 ZONE: 13

QUAD: San Felipe Pueblo

W.H. Brandenburg and M.A. Farrington

EFFORT: 534.3 m²

FAMILY			N
76	<i>Cyprinella</i>	<i>lutrensis</i>	74
76	<i>Pimephales</i>	<i>promelas</i>	38
76	<i>Platygobio</i>	<i>gracilis</i>	4
76	<i>Rhinichthys</i>	<i>cataractae</i>	8
81	<i>Carpodes</i>	<i>carpio</i>	9
81	<i>Catostomus</i>	<i>commersoni</i>	334
93	<i>Ameiurus</i>	<i>melas</i>	1
93	<i>Ictalurus</i>	<i>punctatus</i>	2
212	<i>Gambusia</i>	<i>affinis</i>	55

NEW MEXICO: SANDOVAL CO., RIO GRANDE DRAINAGE
Rio Grande, at NM State HWY 44 bridge crossing, Bernalillo.

15 August 2000

SPP00-125

RIVER MILE: 203.8

UTM EASTING: 358543 UTM NORTHING: 3909722 ZONE: 13

QUAD: Bernalillo

W.H. Brandenburg and M.A. Farrington

EFFORT: 563.0 m²

FAMILY			N
76	<i>Cyprinella</i>	<i>lutrensis</i>	49
76	<i>Pimephales</i>	<i>promelas</i>	15
76	<i>Platygobio</i>	<i>gracilis</i>	1
76	<i>Rhinichthys</i>	<i>cataractae</i>	1
81	<i>Carpodes</i>	<i>carpio</i>	3
81	<i>Catostomus</i>	<i>commersoni</i>	92
93	<i>Ameiurus</i>	<i>natalis</i>	1
212	<i>Gambusia</i>	<i>affinis</i>	1

*** All data are provisional and should be verified by direct inspection of field data and specimens whenever possible***

Rio Grande silvery minnow Population Monitoring (August)

NEW MEXICO: SANDOVAL CO., RIO GRANDE DRAINAGE

Rio Grande, ca. 4.0 miles downstream of NM State HWY 44 bridge crossing, at Rio Rancho Wastewater Treatment Plant, Rio Rancho.

15 August 2000

SPP00-126

RIVER MILE: 200.0

UTM EASTING: 354772 UTM NORTHING: 3905355 ZONE: 13

QUAD: Bernalillo

W.H. Brandenburg and M.A. Farrington

EFFORT: 599.3 m²

FAMILY			N
76	<i>Cyprinella</i>	<i>lutrensis</i>	45
76	<i>Pimephales</i>	<i>promelas</i>	15
76	<i>Platygobio</i>	<i>gracilis</i>	1
76	<i>Rhinichthys</i>	<i>cataractae</i>	3
81	<i>Carpodes</i>	<i>carpio</i>	56
81	<i>Catostomus</i>	<i>commersoni</i>	137
93	<i>Ictalurus</i>	<i>punctatus</i>	10
212	<i>Gambusia</i>	<i>affinis</i>	190
283	<i>Morone</i>	<i>chrysops</i>	2
294	<i>Micropterus</i>	<i>dolomieu</i>	1

NEW MEXICO: BERNALILLO CO., RIO GRANDE DRAINAGE

Rio Grande, at Central Avenue bridge crossing (US HWY 66), Albuquerque.

11 August 2000

SPP00-123

RIVER MILE: 183.4

UTM EASTING: 346840 UTM NORTHING: 3884094 ZONE: 13

QUAD: Albuquerque West

W.H. Brandenburg and M.A. Farrington

EFFORT: 576.0 m²

FAMILY			N
76	<i>Cyprinella</i>	<i>lutrensis</i>	49
76	<i>Pimephales</i>	<i>promelas</i>	9
76	<i>Platygobio</i>	<i>gracilis</i>	1
81	<i>Carpodes</i>	<i>carpio</i>	87
81	<i>Catostomus</i>	<i>commersoni</i>	69
93	<i>Ameiurus</i>	<i>natalis</i>	2
93	<i>Ictalurus</i>	<i>punctatus</i>	52
212	<i>Gambusia</i>	<i>affinis</i>	188
283	<i>Morone</i>	<i>chrysops</i>	5

*** All data are provisional and should be verified by direct inspection of field data and specimens whenever possible***

Rio Grande silvery minnow Population Monitoring (August)

NEW MEXICO: BERNALILLO CO., RIO GRANDE DRAINAGE

Rio Grande, at Rio Bravo Blvd. bridge crossing (NM State HWY 500) , Albuquerque.

11 August 2000

SPP00-122

RIVER MILE: 178.3

UTM EASTING: 347554 UTM NORTHING: 3877163 ZONE: 13

QUAD: Albuquerque West

W.H. Brandenburg and M.A. Farrington

EFFORT: 637.3 m²

FAMILY			N
76	<i>Cyprinella</i>	<i>lutrensis</i>	326
76	<i>Pimephales</i>	<i>promelas</i>	3
81	<i>Carpiodes</i>	<i>carpio</i>	15
81	<i>Catostomus</i>	<i>commersoni</i>	20
93	<i>Ictalurus</i>	<i>punctatus</i>	92
212	<i>Gambusia</i>	<i>affinis</i>	163

NEW MEXICO: VALENCIA CO., RIO GRANDE DRAINAGE

Rio Grande, ca. 1.0 miles upstream of NM State HWY 309/6 bridge crossing, Belen.

11 August 2000

SPP00-121

RIVER MILE: 151.5

UTM EASTING: 339972 UTM NORTHING: 3837061 ZONE: 13

QUAD: Tome

W.H. Brandenburg and M.A. Farrington

EFFORT: 609.3 m²

FAMILY			N
76	<i>Cyprinella</i>	<i>lutrensis</i>	668
76	<i>Cyprinus</i>	<i>carpio</i>	5
76	<i>Pimephales</i>	<i>promelas</i>	95
81	<i>Carpiodes</i>	<i>carpio</i>	243
93	<i>Ictalurus</i>	<i>punctatus</i>	57
212	<i>Gambusia</i>	<i>affinis</i>	10

*** All data are provisional and should be verified by direct inspection of field data and specimens whenever possible***

Rio Grande silvery minnow Population Monitoring (August)

NEW MEXICO: SOCORRO CO., RIO GRANDE DRAINAGE

Rio Grande, at US HWY 60 bridge crossing, Bernardo.

04 August 2000

SPP00-120

RIVER MILE: 130.6

UTM EASTING: 334604 UTM NORTHING: 3809726 ZONE: 13

QUAD: Abeytas

W.H. Brandenburg, M.A. Farrington, and K.L. Torres

EFFORT: 435.8 m²

FAMILY			N
76	<i>Cyprinella</i>	<i>lutrensis</i>	349
76	<i>Cyprinus</i>	<i>carpio</i>	19
76	<i>Pimephales</i>	<i>promelas</i>	141
81	<i>Carpiodes</i>	<i>carpio</i>	198
81	<i>Catostomus</i>	<i>commersoni</i>	10
93	<i>Ictalurus</i>	<i>punctatus</i>	90
212	<i>Gambusia</i>	<i>affinis</i>	127
294	<i>Micropterus</i>	<i>salmoides</i>	1

NEW MEXICO: SOCORRO CO., RIO GRANDE DRAINAGE

Rio Grande, directly below San Acacia Diversion Dam, San Acacia.

04 August 2000

SPP00-119

RIVER MILE: 116.2

UTM EASTING: 326162 UTM NORTHING: 3791977 ZONE: 13

QUAD: San Acacia

W.H. Brandenburg, M.A. Farrington, and K.L. Torres

EFFORT: 405.5 m²

FAMILY			N
69	<i>Dorosoma</i>	<i>cepedianum</i>	3
76	<i>Cyprinella</i>	<i>lutrensis</i>	2307
76	<i>Cyprinus</i>	<i>carpio</i>	1
76	<i>Hybognathus</i>	<i>amarus*</i>	84
76	<i>Pimephales</i>	<i>promelas</i>	8
76	<i>Platygobio</i>	<i>gracilis</i>	36
76	<i>Rhinichthys</i>	<i>cataractae</i>	2
81	<i>Carpiodes</i>	<i>carpio</i>	2
81	<i>Catostomus</i>	<i>commersoni</i>	1
93	<i>Ictalurus</i>	<i>punctatus</i>	9
212	<i>Gambusia</i>	<i>affinis</i>	80
295	<i>Stizostedion</i>	<i>vitreum</i>	1

*** *Hybognathus amarus* by age class:**

age 0	78
age 1	6

*** All data are provisional and should be verified by direct inspection of field data and specimens whenever possible***

Rio Grande silvery minnow Population Monitoring (August)

NEW MEXICO: SOCORRO CO., RIO GRANDE DRAINAGE

Rio Grande, ca. 1.5 miles downstream of San Acacia Diversion Dam, San Acacia.

04 August 2000

SPP00-118

RIVER MILE: 114.6

UTM EASTING: 325263

UTM NORTHING: 3790442

ZONE: 13

QUAD: Lemitar

W.H. Brandenburg, M.A. Farrington, and K.L. Torres

EFFORT: 475.5 m²

FAMILY			N
76	<i>Cyprinella</i>	<i>lutrensis</i>	759
76	<i>Hybognathus</i>	<i>amarus</i> *	24
76	<i>Pimephales</i>	<i>promelas</i>	6
76	<i>Platygobio</i>	<i>gracilis</i>	166
76	<i>Rhinichthys</i>	<i>cataractae</i>	1
81	<i>Carpodes</i>	<i>carpio</i>	21
81	<i>Catostomus</i>	<i>commersoni</i>	1
93	<i>Ictalurus</i>	<i>punctatus</i>	4
212	<i>Gambusia</i>	<i>affinis</i>	16

* *Hybognathus amarus* by age class:

age 0	17
age 1	7

NEW MEXICO: SOCORRO CO., RIO GRANDE DRAINAGE

Rio Grande, east of Socorro, 0.5 miles upstream of Socorro Low Flow Conveyance Channel bridge;
east and just upstream of Socorro Wastewater Treatment Plant, Socorro.

03 August 2000

SPP00-117

RIVER MILE: 99.5

UTM EASTING: 327097

UTM NORTHING: 3771043

ZONE: 13

QUAD: Loma de las Canas

W.H. Brandenburg, M.A. Farrington, and D.E. Gibson

EFFORT: 759.0 m²

FAMILY			N
76	<i>Cyprinella</i>	<i>lutrensis</i>	554
76	<i>Hybognathus</i>	<i>amarus</i> *	34
76	<i>Pimephales</i>	<i>promelas</i>	33
76	<i>Platygobio</i>	<i>gracilis</i>	4
81	<i>Carpodes</i>	<i>carpio</i>	43
81	<i>Catostomus</i>	<i>commersoni</i>	1
93	<i>Ictalurus</i>	<i>punctatus</i>	5
212	<i>Gambusia</i>	<i>affinis</i>	106

* *Hybognathus amarus* by age class:

age 0	13
age 1	21

*** All data are provisional and should be verified by direct inspection of field data and specimens whenever possible***

Rio Grande silvery minnow Population Monitoring (August)

NEW MEXICO: SOCORRO CO., RIO GRANDE DRAINAGE

Rio Grande, ca. 4.0 miles upstream of U.S. HWY 380 bridge crossing.

03 August 2000

SPP00-116

RIVER MILE: 91.7

UTM EASTING: 328140 UTM NORTHING: 3761283 ZONE: 13

QUAD: San Antonio

W.H. Brandenburg, M.A. Farrington, and D.E. Gibson

EFFORT: 837.0 m²

FAMILY			N
76	<i>Cyprinella</i>	<i>lutrensis</i>	488
76	<i>Cyprinus</i>	<i>carpio</i>	22
76	<i>Hybognathus</i>	<i>amarus</i> *	76
76	<i>Platygobio</i>	<i>gracilis</i>	6
81	<i>Carpiodes</i>	<i>carpio</i>	42
93	<i>Ictalurus</i>	<i>punctatus</i>	15
212	<i>Gambusia</i>	<i>affinis</i>	37
295	<i>Stizostedion</i>	<i>vitreum</i>	1

* *Hybognathus amarus* by age class:

age 0	32
age 1	44

NEW MEXICO: SOCORRO CO., RIO GRANDE DRAINAGE

Rio Grande, at US HWY 380 bridge crossing, San Antonio.

03 August 2000

SPP00-115

RIVER MILE: 87.1

UTM EASTING: 328914 UTM NORTHING: 3754471 ZONE: 13

QUAD: San Antonio

W.H. Brandenburg, M.A. Farrington, and D.E. Gibson

EFFORT: 777.5 m²

FAMILY			N
76	<i>Cyprinella</i>	<i>lutrensis</i>	882
76	<i>Cyprinus</i>	<i>carpio</i>	7
76	<i>Hybognathus</i>	<i>amarus</i> *	17
76	<i>Pimephales</i>	<i>promelas</i>	78
81	<i>Carpiodes</i>	<i>carpio</i>	30
93	<i>Ictalurus</i>	<i>punctatus</i>	6
212	<i>Gambusia</i>	<i>affinis</i>	94
294	<i>Micropterus</i>	<i>salmoides</i>	1

* *Hybognathus amarus* by age class:

age 0	14
age 1	3

*** All data are provisional and should be verified by direct inspection of field data and specimens whenever possible***

Rio Grande silvery minnow Population Monitoring (August)

NEW MEXICO: SOCORRO CO., RIO GRANDE DRAINAGE

Rio Grande, directly east of Bosque del Apache National Wildlife Refuge Headquarters.

02 August 2000

SPP00-114

RIVER MILE: 79.1

UTM EASTING: 327055 UTM NORTHING: 3740839 ZONE: 13

QUAD: San Antonio SE

R.K. Dudley, W.H. Brandenburg, and M.A. Farrington

EFFORT: 667.8 m²

FAMILY			N
76	<i>Cyprinella</i>	<i>lutrensis</i>	394
76	<i>Cyprinus</i>	<i>carpio</i>	6
76	<i>Hybognathus</i>	<i>amarus</i> *	47
76	<i>Pimephales</i>	<i>promelas</i>	4
81	<i>Carpodes</i>	<i>carpio</i>	6
93	<i>Ictalurus</i>	<i>punctatus</i>	13
212	<i>Gambusia</i>	<i>affinis</i>	24

* *Hybognathus amarus* by age class:

age 0	45
age 1	2

NEW MEXICO: SOCORRO CO., RIO GRANDE DRAINAGE

Rio Grande, at San Marcial Railroad bridge crossing, San Marcial.

02 August 2000

SPP00-113

RIVER MILE: 68.8

UTM EASTING: 315284 UTM NORTHING: 3728347 ZONE: 13

QUAD: San Marcial

R.K. Dudley, W.H. Brandenburg, and M.A. Farrington

EFFORT: 445.3 m²

FAMILY			N
69	<i>Dorosoma</i>	<i>cepedianum</i>	1
76	<i>Cyprinella</i>	<i>lutrensis</i>	197
76	<i>Cyprinus</i>	<i>carpio</i>	4
76	<i>Hybognathus</i>	<i>amarus</i> *	7
76	<i>Pimephales</i>	<i>promelas</i>	4
81	<i>Carpodes</i>	<i>carpio</i>	3
93	<i>Ictalurus</i>	<i>punctatus</i>	10
212	<i>Gambusia</i>	<i>affinis</i>	84

* *Hybognathus amarus* by age class:

age 0	3
age 1	4

*** All data are provisional and should be verified by direct inspection of field data and specimens whenever possible***

Rio Grande silvery minnow Population Monitoring (August)

NEW MEXICO: SOCORRO CO., RIO GRANDE DRAINAGE

Rio Grande, at its former confluence with the Low Flow Conveyance Channel, 16.0 miles downstream of the southern end of Bosque del Apache National Wildlife Refuge; ca. 8 miles downstream of San Marcial Railroad bridge crossing.

02 August 2000

SPP00-112

RIVER MILE: 60.5

UTM EASTING: 309487 UTM NORTHING: 3718178 ZONE: 13

QUAD: Paraje Well

R.K. Dudley, W.H. Brandenburg, and M.A. Farrington

EFFORT: 517.8 m²

FAMILY			N
69	<i>Dorosoma</i>	<i>cepedianum</i>	6
76	<i>Cyprinella</i>	<i>lutrensis</i>	374
76	<i>Cyprinus</i>	<i>carpio</i>	2
76	<i>Hybognathus</i>	<i>amarus*</i>	5
76	<i>Pimephales</i>	<i>promelas</i>	2
81	<i>Carpiodes</i>	<i>carpio</i>	1
93	<i>Ictalurus</i>	<i>punctatus</i>	10
212	<i>Gambusia</i>	<i>affinis</i>	231

*** All data are provisional and should be verified by direct inspection of field data and specimens whenever possible***

Rio Grande silvery minnow Population Monitoring (October)

NEW MEXICO: SANDOVAL CO., RIO GRANDE DRAINAGE
Rio Grande, directly below Angostura Diversion Dam, Angostura.

17 October 2000

SPP00-204

RIVER MILE: 209.7

UTMEASTING: 363811 UTMNORTHING: 3916006 ZONE: 13

QUAD: San Felipe

R.K. Dudley, M.A. Farrington, and W.H. Brandenburg

EFFORT: 377.0 m²

FAMILY			N
69	<i>Dorosoma</i>	<i>cepedianum</i>	1
76	<i>Cyprinella</i>	<i>lutrensis</i>	416
76	<i>Pimephales</i>	<i>promelas</i>	112
76	<i>Rhinichthys</i>	<i>cataractae</i>	10
81	<i>Catostomus</i>	<i>commersoni</i>	25
212	<i>Gambusia</i>	<i>affinis</i>	1091
294	<i>Lepomis</i>	<i>macrochirus</i>	1
294	<i>Micropterus</i>	<i>salmoides</i>	3
295	<i>Perca</i>	<i>flavescens</i>	1

NEW MEXICO: SANDOVAL CO., RIO GRANDE DRAINAGE
Rio Grande, at NM State HWY 44 bridge crossing, Bernalillo.

17 October 2000

SPP00-205

RIVER MILE: 203.8

UTMEASTING: 358543 UTMNORTHING: 3909722 ZONE: 13

QUAD: Bernalillo

R.K. Dudley, M.A. Farrington, and W.H. Brandenburg

EFFORT: 505.0 m²

FAMILY			N
76	<i>Cyprinella</i>	<i>lutrensis</i>	234
76	<i>Pimephales</i>	<i>promelas</i>	46
76	<i>Platygobio</i>	<i>gracilis</i>	1
76	<i>Rhinichthys</i>	<i>cataractae</i>	21
81	<i>Catostomus</i>	<i>commersoni</i>	23
212	<i>Gambusia</i>	<i>affinis</i>	74
294	<i>Pomoxis</i>	<i>annularis</i>	34

*** All data are provisional and should be verified by direct inspection of field data and specimens whenever possible***

Rio Grande silvery minnow Population Monitoring (October)

NEW MEXICO: SANDOVAL CO., RIO GRANDE DRAINAGE

Rio Grande, ca. 4.0 miles downstream of NM State HWY 44 bridge crossing, at Rio Rancho Wastewater Treatment Plant, Rio Rancho.

17 October 2000

SPP00-206

RIVER MILE: 200.0

UTM EASTING: 354772

UTM NORTHING: 3905355

ZONE: 13

QUAD: Bernalillo

R.K. Dudley, M.A. Farrington, and W.H. Brandenburg

EFFORT: 496.3 m²

FAMILY			N
76	<i>Cyprinella</i>	<i>lutrensis</i>	161
76	<i>Pimephales</i>	<i>promelas</i>	9
76	<i>Platygobio</i>	<i>gracilis</i>	5
76	<i>Rhinichthys</i>	<i>cataractae</i>	14
81	<i>Carpodes</i>	<i>carpio</i>	34
81	<i>Catostomus</i>	<i>commersoni</i>	16
212	<i>Gambusia</i>	<i>affinis</i>	422
294	<i>Pomoxis</i>	<i>annularis</i>	11

NEW MEXICO: BERNALILLO CO., RIO GRANDE DRAINAGE

Rio Grande, at Central Avenue bridge crossing (US HWY 66), Albuquerque.

17 October 2000

SPP00-207

RIVER MILE: 183.4

UTM EASTING: 346840

UTM NORTHING: 3884094

ZONE: 13

QUAD: Albuquerque West

R.K. Dudley, M.A. Farrington, and W.H. Brandenburg

EFFORT: 485.0 m²

FAMILY			N
69	<i>Dorosoma</i>	<i>cepedianum</i>	1
76	<i>Cyprinella</i>	<i>lutrensis</i>	74
76	<i>Cyprinus</i>	<i>carpio</i>	1
76	<i>Pimephales</i>	<i>promelas</i>	3
76	<i>Rhinichthys</i>	<i>cataractae</i>	4
81	<i>Carpodes</i>	<i>carpio</i>	10
81	<i>Catostomus</i>	<i>commersoni</i>	6
93	<i>Ameiurus</i>	<i>melas</i>	2
93	<i>Ictalurus</i>	<i>punctatus</i>	89
212	<i>Gambusia</i>	<i>affinis</i>	45
294	<i>Lepomis</i>	<i>macrochirus</i>	1
294	<i>Micropterus</i>	<i>salmoides</i>	1
294	<i>Pomoxis</i>	<i>annularis</i>	3

*** All data are provisional and should be verified by direct inspection of field data and specimens whenever possible***

Rio Grande silvery minnow Population Monitoring (October)

NEW MEXICO: BERNALILLO CO., RIO GRANDE DRAINAGE

Rio Grande, at Rio Bravo Blvd. bridge crossing (NM State HWY 500), Albuquerque.

17 October 2000

SPP00-208

RIVER MILE: 178.3

UTMEASTING: 347554

UTM NORTHING: 3877163

ZONE: 13

QUAD: Albuquerque West

R.K. Dudley, M.A. Farrington, and W.H. Brandenburg

EFFORT: 501.8 m²

FAMILY			N
69	<i>Dorosoma</i>	<i>cepedianum</i>	5
76	<i>Cyprinella</i>	<i>lutrensis</i>	7
76	<i>Pimephales</i>	<i>promelas</i>	8
76	<i>Platygobio</i>	<i>gracilis</i>	1
81	<i>Carpodes</i>	<i>carpio</i>	11
81	<i>Catostomus</i>	<i>commersoni</i>	7
93	<i>Ictalurus</i>	<i>punctatus</i>	39
212	<i>Gambusia</i>	<i>affinis</i>	86
294	<i>Pomoxis</i>	<i>annularis</i>	1

NEW MEXICO: VALENCIA CO., RIO GRANDE DRAINAGE

Rio Grande, ca. 1.0 miles upstream of NM State HWY 309/6 bridge crossing, Belen.

23 October 2000

SPP00-222

RIVER MILE: 151.5

UTMEASTING: 339972

UTM NORTHING: 3837061

ZONE: 13

QUAD: Tome

W.H. Brandenburg and M.A. Farrington

EFFORT: 543.5 m²

FAMILY			N
76	<i>Cyprinella</i>	<i>lutrensis</i>	746
76	<i>Cyprinus</i>	<i>carpio</i>	2
76	<i>Pimephales</i>	<i>promelas</i>	88
76	<i>Platygobio</i>	<i>gracilis</i>	8
81	<i>Carpodes</i>	<i>carpio</i>	45
81	<i>Catostomus</i>	<i>commersoni</i>	1
93	<i>Ictalurus</i>	<i>punctatus</i>	15
212	<i>Gambusia</i>	<i>affinis</i>	67
294	<i>Pomoxis</i>	<i>annularis</i>	1

*** All data are provisional and should be verified by direct inspection of field data and specimens whenever possible***

Rio Grande silvery minnow Population Monitoring (October)

NEW MEXICO: SOCORRO CO., RIO GRANDE DRAINAGE

Rio Grande, at US HWY 60 bridge crossing, Bernardo.

23 October 2000

SPP00-223

RIVER MILE: 130.6

UTM EASTING: 334604

UTM NORTHING: 3809726

ZONE: 13

QUAD: Abeytas

W.H. Brandenburg and M.A. Farrington

EFFORT: 435.0 m²

FAMILY			N
69	<i>Dorosoma</i>	<i>cepedianum</i>	10
76	<i>Cyprinella</i>	<i>lutrensis</i>	423
76	<i>Cyprinus</i>	<i>carpio</i>	3
76	<i>Pimephales</i>	<i>promelas</i>	64
76	<i>Platygobio</i>	<i>gracilis</i>	3
81	<i>Carpiodes</i>	<i>carpio</i>	38
93	<i>Ictalurus</i>	<i>punctatus</i>	23
212	<i>Gambusia</i>	<i>affinis</i>	327
294	<i>Lepomis</i>	<i>macrochirus</i>	1
294	<i>Micropterus</i>	<i>salmoides</i>	1
294	<i>Pomoxis</i>	<i>annularis</i>	8

NEW MEXICO: SOCORRO CO., RIO GRANDE DRAINAGE

Rio Grande, directly below San Acacia Diversion Dam, San Acacia.

23 October 2000

SPP00-224

RIVER MILE: 116.2

UTM EASTING: 326162

UTM NORTHING: 3791977

ZONE: 13

QUAD: San Acacia

W.H. Brandenburg and M.A. Farrington

EFFORT: 426.0 m²

FAMILY			N
76	<i>Cyprinella</i>	<i>lutrensis</i>	152
76	<i>Cyprinus</i>	<i>carpio</i>	2
76	<i>Pimephales</i>	<i>promelas</i>	16
81	<i>Carpiodes</i>	<i>carpio</i>	14
93	<i>Ictalurus</i>	<i>punctatus</i>	61
212	<i>Gambusia</i>	<i>affinis</i>	63
294	<i>Pomoxis</i>	<i>annularis</i>	1

*** All data are provisional and should be verified by direct inspection of field data and specimens whenever possible***

Rio Grande silvery minnow Population Monitoring (October)

NEW MEXICO: SOCORRO CO., RIO GRANDE DRAINAGE

Rio Grande, ca. 1.5 miles downstream of San Acacia Diversion Dam, San Acacia.

23 October 2000

SPP00-225

RIVER MILE: 114.6

UTMEASTING: 325263 UTMNORTHING: 3790442 ZONE: 13

QUAD: Lemitar

W.H. Brandenburg and M.A. Farrington

EFFORT: 473.3 m²

FAMILY			N
76	<i>Cyprinella</i>	<i>lutrensis</i>	1747
76	<i>Pimephales</i>	<i>promelas</i>	30
76	<i>Platygobio</i>	<i>gracilis</i>	20
76	<i>Rhinichthys</i>	<i>cataractae</i>	4
81	<i>Carpodes</i>	<i>carpio</i>	7
93	<i>Ictalurus</i>	<i>punctatus</i>	53
212	<i>Gambusia</i>	<i>affinis</i>	29
295	<i>Perca</i>	<i>flavescens</i>	1

NEW MEXICO: SOCORRO CO., RIO GRANDE DRAINAGE

Rio Grande, east of Socorro, 0.5 miles upstream of Socorro Low Flow Conveyance Channel bridge;
east and just upstream of Socorro Wastewater Treatment Plant, Socorro.

24 October 2000

SPP00-227

RIVER MILE: 99.5

UTMEASTING: 327097 UTMNORTHING: 3771043 ZONE: 13

QUAD: Loma de las Canas

R.K. Dudley, M.A. Farrington, and W.H. Brandenburg

EFFORT: 520.8 m²

FAMILY			N
76	<i>Cyprinella</i>	<i>lutrensis</i>	673
76	<i>Cyprinus</i>	<i>carpio</i>	1
76	<i>Hybognathus</i>	<i>amarus</i>	7
76	<i>Pimephales</i>	<i>promelas</i>	14
76	<i>Platygobio</i>	<i>gracilis</i>	3
81	<i>Carpodes</i>	<i>carpio</i>	13
93	<i>Ictalurus</i>	<i>punctatus</i>	11
212	<i>Gambusia</i>	<i>affinis</i>	18
294	<i>Pomoxis</i>	<i>annularis</i>	2

*** All data are provisional and should be verified by direct inspection of field data and specimens whenever possible***

Rio Grande silvery minnow Population Monitoring (October)

NEW MEXICO: SOCORRO CO., RIO GRANDE DRAINAGE

Rio Grande, ca. 4.0 miles upstream of U.S. HWY 380 bridge crossing.

24 October 2000

SPP00-228

RIVER MILE: 91.7

UTMEASTING: 328140 UTMNORTHING: 3761283 ZONE: 13

QUAD: San Antonio

R.K. Dudley, M.A. Farrington, and W.H. Brandenburg

EFFORT: 616.0 m²

FAMILY			N
76	<i>Cyprinella</i>	<i>lutrensis</i>	330
76	<i>Cyprinus</i>	<i>carpio</i>	2
76	<i>Hybognathus</i>	<i>amarus</i>	7
76	<i>Pimephales</i>	<i>promelas</i>	1
76	<i>Platygobio</i>	<i>gracilis</i>	6
81	<i>Carpiodes</i>	<i>carpio</i>	16
93	<i>Ictalurus</i>	<i>punctatus</i>	6
212	<i>Gambusia</i>	<i>affinis</i>	2

NEW MEXICO: SOCORRO CO., RIO GRANDE DRAINAGE

Rio Grande, at US HWY 380 bridge crossing, San Antonio.

24 October 2000

SPP00-229

RIVER MILE: 87.1

UTMEASTING: 328914 UTMNORTHING: 3754471 ZONE: 13

QUAD: San Antonio

R.K. Dudley, M.A. Farrington, and W.H. Brandenburg

EFFORT: 586.5 m²

FAMILY			N
69	<i>Dorosoma</i>	<i>cepedianum</i>	1
76	<i>Cyprinella</i>	<i>lutrensis</i>	1461
76	<i>Cyprinus</i>	<i>carpio</i>	1
76	<i>Hybognathus</i>	<i>amarus</i>	2
76	<i>Pimephales</i>	<i>promelas</i>	1
81	<i>Carpiodes</i>	<i>carpio</i>	19
93	<i>Ictalurus</i>	<i>punctatus</i>	3
212	<i>Gambusia</i>	<i>affinis</i>	26
294	<i>Pomoxis</i>	<i>annularis</i>	5

*** All data are provisional and should be verified by direct inspection of field data and specimens whenever possible***

Rio Grande silvery minnow Population Monitoring (October)

NEW MEXICO: SOCORRO CO., RIO GRANDE DRAINAGE

Rio Grande, directly east of Bosque del Apache National Wildlife Refuge Headquarters.

25 October 2000

SPP00-236

RIVER MILE: 79.1

UTM EASTING: 327055 UTM NORTHING: 3740839 ZONE: 13

QUAD: San Antonio SE

R.K. Dudley, M.A. Farrington, and W.H. Brandenburg

EFFORT: 610.0 m²

FAMILY			N
76	<i>Cyprinella</i>	<i>lutrensis</i>	244
76	<i>Hybognathus</i>	<i>amarus</i>	3
76	<i>Pimephales</i>	<i>promelas</i>	2
93	<i>Ictalurus</i>	<i>punctatus</i>	2
212	<i>Gambusia</i>	<i>affinis</i>	31

NEW MEXICO: SOCORRO CO., RIO GRANDE DRAINAGE

Rio Grande, at San Marcial Railroad bridge crossing, San Marcial.

25 October 2000

SPP00-234

RIVER MILE: 68.6

UTM EASTING: 315284 UTM NORTHING: 3728347 ZONE: 13

QUAD: San Marcial

R.K. Dudley, M.A. Farrington, and W.H. Brandenburg

EFFORT: 608.5 m²

FAMILY			N
76	<i>Cyprinella</i>	<i>lutrensis</i>	464
76	<i>Cyprinus</i>	<i>carpio</i>	1
76	<i>Hybognathus</i>	<i>amarus</i>	14
76	<i>Pimephales</i>	<i>promelas</i>	3
76	<i>Platygobio</i>	<i>gracilis</i>	1
81	<i>Carpodes</i>	<i>carpio</i>	4
93	<i>Ictalurus</i>	<i>punctatus</i>	7
212	<i>Gambusia</i>	<i>affinis</i>	47
294	<i>Pomoxis</i>	<i>annularis</i>	6

*** All data are provisional and should be verified by direct inspection of field data and specimens whenever possible***

Rio Grande silvery minnow Population Monitoring (October)

NEW MEXICO: SOCORRO CO., RIO GRANDE DRAINAGE

Rio Grande, at its former confluence with the Low Flow Conveyance Channel, 16.0 miles downstream of the southern end of Bosque del Apache National Wildlife Refuge; ca. 8 miles downstream of San Marcial Railroad bridge crossing.

25 October 2000

SPP00-232

RIVER MILE: 60.5

UTMEASTING: 309487

UTM NORTHING: 3718178

ZONE: 13

QUAD: Paraje Well

R.K. Dudley, M.A. Farrington, and W.H. Brandenburg

EFFORT: 477.5 m²

FAMILY			N
76	<i>Cyprinella</i>	<i>lutrensis</i>	372
76	<i>Hybognathus</i>	<i>amarus</i>	3
76	<i>Pimephales</i>	<i>promelas</i>	2
81	<i>Carpionodes</i>	<i>carpio</i>	1
93	<i>Ictalurus</i>	<i>punctatus</i>	1
212	<i>Gambusia</i>	<i>affinis</i>	115
294	<i>Pomoxis</i>	<i>annularis</i>	1

*** All data are provisional and should be verified by direct inspection of field data and specimens whenever possible***

Rio Grande silvery minnow Population Monitoring (December)

NEW MEXICO: SANDOVAL CO., RIO GRANDE DRAINAGE
Rio Grande, directly below Angostura Diversion Dam, Angostura.

12 December 2000

SPP00-267

RIVER MILE: 209.7

UTMEASTING: 363811 UTMNORTHING: 3916006 ZONE: 13

QUAD: San Felipe

R.K. Dudley, W.H. Brandenburg, and D.E. Gibson

EFFORT: 456.3 m²

FAMILY			N
76	<i>Cyprinella</i>	<i>lutrensis</i>	1
76	<i>Rhinichthys</i>	<i>cataractae</i>	8
81	<i>Catostomus</i>	<i>commersoni</i>	1
212	<i>Gambusia</i>	<i>affinis</i>	1

NEW MEXICO: SANDOVAL CO., RIO GRANDE DRAINAGE
Rio Grande, at NM State HWY 44 bridge crossing, Bernalillo.

12 December 2000

SPP00-268

RIVER MILE: 203.8

UTMEASTING: 358543 UTMNORTHING: 3909722 ZONE: 13

QUAD: Bernalillo

R.K. Dudley, W.H. Brandenburg, and D.E. Gibson

EFFORT: 530.8 m²

FAMILY			N
76	<i>Cyprinella</i>	<i>lutrensis</i>	113
76	<i>Pimephales</i>	<i>promelas</i>	8
81	<i>Carpiodes</i>	<i>carpio</i>	1
81	<i>Catostomus</i>	<i>commersoni</i>	1
212	<i>Gambusia</i>	<i>affinis</i>	3

*** All data are provisional and should be verified by direct inspection of field data and specimens whenever possible***

Rio Grande silvery minnow Population Monitoring (December)

NEW MEXICO: SANDOVAL CO., RIO GRANDE DRAINAGE

Rio Grande, ca. 4.0 miles downstream of NM State HWY 44 bridge crossing, at Rio Rancho Wastewater Treatment Plant, Rio Rancho.

12 December 2000

SPP00-269

RIVER MILE: 200.0

UTM EASTING: 354772 UTM NORTHING: 3905355 ZONE: 13

QUAD: Bernalillo

R.K. Dudley, W.H. Brandenburg, and D.E. Gibson

EFFORT: 542.0 m²

FAMILY			N
76	<i>Cyprinella</i>	<i>lutrensis</i>	16
76	<i>Rhinichthys</i>	<i>cataractae</i>	5
212	<i>Gambusia</i>	<i>affinis</i>	102

NEW MEXICO: BERNALILLO CO., RIO GRANDE DRAINAGE

Rio Grande, at Central Avenue bridge crossing (US HWY 66), Albuquerque.

13 December 2000

SPP00-272

RIVER MILE: 183.4

UTM EASTING: 346840 UTM NORTHING: 3884094 ZONE: 13

QUAD: Albuquerque West

R.K. Dudley, W.H. Brandenburg, and D.E. Gibson

EFFORT: 518.8 m²

FAMILY			N
76	<i>Cyprinella</i>	<i>lutrensis</i>	2
76	<i>Pimephales</i>	<i>promelas</i>	1
93	<i>Ictalurus</i>	<i>punctatus</i>	5
212	<i>Gambusia</i>	<i>affinis</i>	10
294	<i>Lepomis</i>	<i>macrochirus</i>	1

*** All data are provisional and should be verified by direct inspection of field data and specimens whenever possible***

Rio Grande silvery minnow Population Monitoring (December)

NEW MEXICO: BERNALILLO CO., RIO GRANDE DRAINAGE

Rio Grande, at Rio Bravo Blvd. bridge crossing (NM State HWY 500), Albuquerque.

13 December 2000

SPP00-271

RIVER MILE: 178.3

UTMEASTING: 347554

UTM NORTHING: 3877163

ZONE: 13

QUAD: Albuquerque West

R.K. Dudley, W.H. Brandenburg, and D.E. Gibson

EFFORT: 631.0 m²

FAMILY			N
76	<i>Cyprinella</i>	<i>lutrensis</i>	1
76	<i>Platygobio</i>	<i>gracilis</i>	2
81	<i>Catostomus</i>	<i>commersoni</i>	1
93	<i>Ictalurus</i>	<i>punctatus</i>	3

NEW MEXICO: VALENCIA CO., RIO GRANDE DRAINAGE

Rio Grande, ca. 1.0 miles upstream of NM State HWY 309/6 bridge crossing, Belen.

13 December 2000

SPP00-270

RIVER MILE: 151.5

UTMEASTING: 339972

UTM NORTHING: 3837061

ZONE: 13

QUAD: Tome

R.K. Dudley, W.H. Brandenburg, and D.E. Gibson

EFFORT: 495.3 m²

FAMILY			N
76	<i>Cyprinella</i>	<i>lutrensis</i>	367
76	<i>Cyprinus</i>	<i>carpio</i>	1
76	<i>Pimephales</i>	<i>promelas</i>	43
81	<i>Carpodes</i>	<i>carpio</i>	39
93	<i>Ictalurus</i>	<i>punctatus</i>	3
212	<i>Gambusia</i>	<i>affinis</i>	5
294	<i>Pomoxis</i>	<i>annularis</i>	6

*** All data are provisional and should be verified by direct inspection of field data and specimens whenever possible***

Rio Grande silvery minnow Population Monitoring (December)

NEW MEXICO: SOCORRO CO., RIO GRANDE DRAINAGE

Rio Grande, at US HWY 60 bridge crossing, Bernardo.

12 December 2000

SPP00-266

RIVER MILE: 130.6

UTMEASTING: 334604 UTMNORTHING: 3809726 ZONE: 13

QUAD: Abeytas

R.K. Dudley, W.H. Brandenburg, and D.E. Gibson

EFFORT: 649.0 m²

FAMILY			N
76	<i>Cyprinella</i>	<i>lutrensis</i>	324
76	<i>Pimephales</i>	<i>promelas</i>	22
76	<i>Platygobio</i>	<i>gracilis</i>	1
81	<i>Carpiodes</i>	<i>carpio</i>	13
93	<i>Ictalurus</i>	<i>punctatus</i>	1
212	<i>Gambusia</i>	<i>affinis</i>	246
294	<i>Pomoxis</i>	<i>annularis</i>	25

NEW MEXICO: SOCORRO CO., RIO GRANDE DRAINAGE

Rio Grande, directly below San Acacia Diversion Dam, San Acacia.

11 December 2000

SPP00-265

RIVER MILE: 116.2

UTMEASTING: 326162 UTMNORTHING: 3791977 ZONE: 13

QUAD: San Acacia

R.K. Dudley, W.H. Brandenburg, and D.E. Gibson

EFFORT: 509.3 m²

FAMILY			N
76	<i>Cyprinella</i>	<i>lutrensis</i>	483
76	<i>Pimephales</i>	<i>promelas</i>	11
76	<i>Platygobio</i>	<i>gracilis</i>	10
81	<i>Carpiodes</i>	<i>carpio</i>	6
294	<i>Pomoxis</i>	<i>annularis</i>	3

*** All data are provisional and should be verified by direct inspection of field data and specimens whenever possible***

Rio Grande silvery minnow Population Monitoring (December)

NEW MEXICO: SOCORRO CO., RIO GRANDE DRAINAGE

Rio Grande, ca. 1.5 miles downstream of San Acacia Diversion Dam, San Acacia.

11 December 2000

SPP00-264

RIVER MILE: 114.6

UTMEASTING: 325263 UTMNORTHING: 3790442 ZONE: 13

QUAD: Lemitar

R.K. Dudley, W.H. Brandenburg, and D.E. Gibson

EFFORT: 516.5 m²

FAMILY			N
76	<i>Cyprinella</i>	<i>lutrensis</i>	119
76	<i>Hybognathus</i>	<i>amarus</i>	1
76	<i>Platygobio</i>	<i>gracilis</i>	5
81	<i>Carpodes</i>	<i>carpio</i>	17

NEW MEXICO: SOCORRO CO., RIO GRANDE DRAINAGE

Rio Grande, east of Socorro, 0.5 miles upstream of Socorro Low Flow Conveyance Channel bridge;
east and just upstream of Socorro Wastewater Treatment Plant, Socorro.

11 December 2000

SPP00-263

RIVER MILE: 99.5

UTMEASTING: 327097 UTMNORTHING: 3771043 ZONE: 13

QUAD: Loma de las Canas

R.K. Dudley, W.H. Brandenburg, and D.E. Gibson

EFFORT: 566.5 m²

FAMILY			N
76	<i>Cyprinella</i>	<i>lutrensis</i>	1229
76	<i>Hybognathus</i>	<i>amarus*</i>	33
76	<i>Pimephales</i>	<i>promelas</i>	5
76	<i>Platygobio</i>	<i>gracilis</i>	4
81	<i>Carpodes</i>	<i>carpio</i>	26
93	<i>Ictalurus</i>	<i>punctatus</i>	1
212	<i>Gambusia</i>	<i>affinis</i>	3
294	<i>Pomoxis</i>	<i>annularis</i>	2

*** All data are provisional and should be verified by direct inspection of field data and specimens whenever possible***

Rio Grande silvery minnow Population Monitoring (December)

NEW MEXICO: SOCORRO CO., RIO GRANDE DRAINAGE

Rio Grande, ca. 4.0 miles upstream of U.S. HWY 380 bridge crossing.

11 December 2000

SPP00-262

RIVER MILE: 91.7

UTMEASTING: 328140 UTMNORTHING: 3761283 ZONE: 13

QUAD: San Antonio

R.K. Dudley, W.H. Brandenburg, and D.E. Gibson

EFFORT: 646.3 m²

FAMILY			N
69	<i>Dorosoma</i>	<i>cepedianum</i>	1
76	<i>Cyprinella</i>	<i>lutrensis</i>	1018
76	<i>Cyprinus</i>	<i>carpio</i>	1
76	<i>Hybognathus</i>	<i>amarus</i>	15
76	<i>Pimephales</i>	<i>promelas</i>	28
76	<i>Platygobio</i>	<i>gracilis</i>	7
81	<i>Carpiodes</i>	<i>carpio</i>	51
93	<i>Ictalurus</i>	<i>punctatus</i>	1
212	<i>Gambusia</i>	<i>affinis</i>	6
294	<i>Pomoxis</i>	<i>annularis</i>	5

NEW MEXICO: SOCORRO CO., RIO GRANDE DRAINAGE

Rio Grande, at US HWY 380 bridge crossing, San Antonio.

11 December 2000

SPP00-261

RIVER MILE: 87.1

UTMEASTING: 328914 UTMNORTHING: 3754471 ZONE: 13

QUAD: San Antonio

R.K. Dudley, W.H. Brandenburg, and D.E. Gibson

EFFORT: 559.0 m²

FAMILY			N
76	<i>Cyprinella</i>	<i>lutrensis</i>	1842
76	<i>Hybognathus</i>	<i>amarus</i>	24
76	<i>Pimephales</i>	<i>promelas</i>	11
76	<i>Platygobio</i>	<i>gracilis</i>	1
81	<i>Carpiodes</i>	<i>carpio</i>	24
93	<i>Ictalurus</i>	<i>punctatus</i>	1
212	<i>Gambusia</i>	<i>affinis</i>	5
294	<i>Pomoxis</i>	<i>annularis</i>	9

*** All data are provisional and should be verified by direct inspection of field data and specimens whenever possible***

Rio Grande silvery minnow Population Monitoring (December)

NEW MEXICO: SOCORRO CO., RIO GRANDE DRAINAGE

Rio Grande, directly east of Bosque del Apache National Wildlife Refuge Headquarters.

08 December 2000

SPP00-260

RIVER MILE: 79.1

UTM EASTING: 327055 UTM NORTHING: 3740839 ZONE: 13

QUAD: San Antonio SE

W.H. Brandenburg and D.E. Gibson

EFFORT: 651.5 m²

FAMILY			N
69	<i>Dorosoma</i>	<i>cepedianum</i>	1
76	<i>Cyprinella</i>	<i>lutrensis</i>	650
76	<i>Hybognathus</i>	<i>amarus</i>	14
76	<i>Pimephales</i>	<i>promelas</i>	1
81	<i>Carpodes</i>	<i>carpio</i>	15
212	<i>Gambusia</i>	<i>affinis</i>	102
294	<i>Lepomis</i>	<i>macrochirus</i>	1
294	<i>Pomoxis</i>	<i>annularis</i>	3

NEW MEXICO: SOCORRO CO., RIO GRANDE DRAINAGE

Rio Grande, at San Marcial Railroad bridge crossing, San Marcial.

08 December 2000

SPP00-259

RIVER MILE: 68.8

UTM EASTING: 315284 UTM NORTHING: 3728347 ZONE: 13

QUAD: San Marcial

W.H. Brandenburg and D.E. Gibson

EFFORT: 621.5 m²

FAMILY			N
76	<i>Cyprinella</i>	<i>lutrensis</i>	174
76	<i>Hybognathus</i>	<i>amarus</i>	5
76	<i>Pimephales</i>	<i>promelas</i>	2
81	<i>Carpodes</i>	<i>carpio</i>	5

*** All data are provisional and should be verified by direct inspection of field data and specimens whenever possible***

Rio Grande silvery minnow Population Monitoring (December)

NEW MEXICO: SOCORRO CO., RIO GRANDE DRAINAGE

Rio Grande, at its former confluence with the Low Flow Conveyance Channel, 16.0 miles downstream of the southern end of Bosque del Apache National Wildlife Refuge; ca. 8 miles downstream of San Marcial Railroad bridge crossing.

08 December 2000

SPP00-258

RIVER MILE: 60.5

UTM EASTING: 309487

UTM NORTHING: 3718178

ZONE: 13

QUAD: Paraje Well

W.H. Brandenburg and D.E. Gibson

EFFORT: 474.8 m²

FAMILY			N
76	<i>Cyprinella</i>	<i>lutrensis</i>	176
76	<i>Hybognathus</i>	<i>amarus</i>	9
81	<i>Carpiodes</i>	<i>carpio</i>	5
212	<i>Gambusia</i>	<i>affinis</i>	3

*** All data are provisional and should be verified by direct inspection of field data and specimens whenever possible***